NOVEMBER 19, 1951

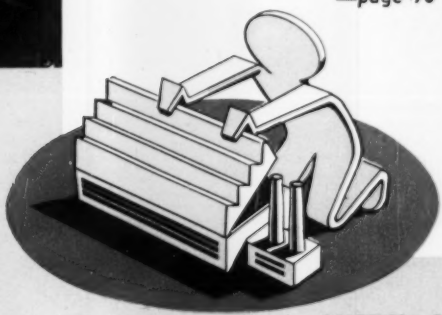
STEEL

THE WEEKLY MAGAZINE OF METALWORKING

The Search Is On for

TOOL BUILDING SUBCONTRACTORS

—page 70



Printing Press Manufacturer Builds Chucking Machines

PRICE RIVER RISING
—And Labor Isn't Manning the Levees, p. 59

STANDARDIZED COMPONENTS
—Die Assembly Costs Are Reduced, p. 91

REVAMPED MACHINING SETUPS
—Production Rates Take Long Leaps, p. 92

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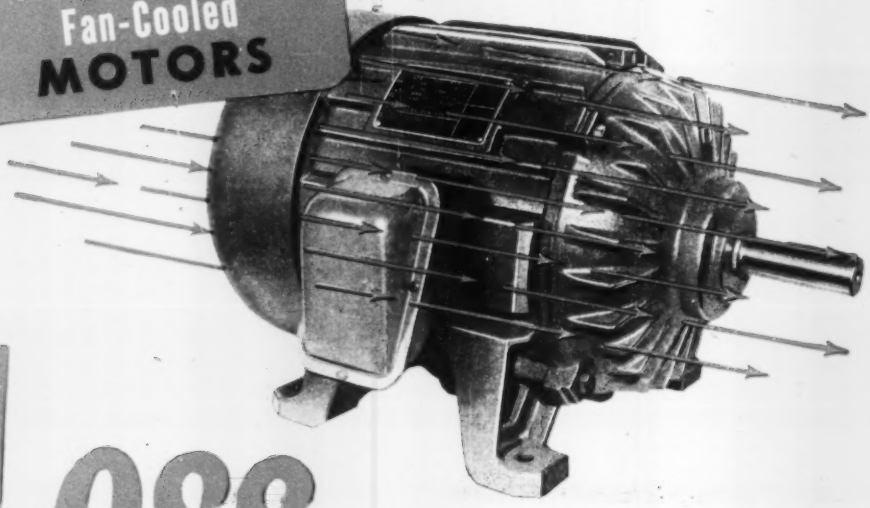
ALLIS-CHALMERS
Totally-Enclosed Fan-Cooled MOTORS



Less MOTOR CLEANING ...INSPECTION...OVERHAUL!

HERE'S A MOTOR that actually blows itself clean! Dirt is carried away by cooling air blown over the ribbed cast iron frame and bearing housings of this new Allis-Chalmers tefc motor.

Dirt can't build up to cause overheating. Concealed air passages and pockets have been eliminated. Even oily dirt that sticks can simply be wiped or blown off.

And this means savings! Maintenance costs are traditionally low on totally-enclosed, fan-cooled motors. But they're lower than ever before on the new Allis-Chalmers Type APZ tefc motor.

Rigid Construction

The frame is cast iron which has high resistance against corrosion and distortion. Bearings are pre-lubricated at the factory and should need no attention for years. Tapped holes with pipe plugs to permit regreasing and to provide grease relief are standard equipment.

Get All The Facts

The new Allis-Chalmers Type APZ totally-enclosed, fan-cooled motor is built in all NEMA standard frame sizes from 224* to 505. Also in explosion-proof type. Your A-C Authorized Distributor or District Office has complete information. Call today, or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 51B7225.

A-3426

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

TEXROPE — Belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.

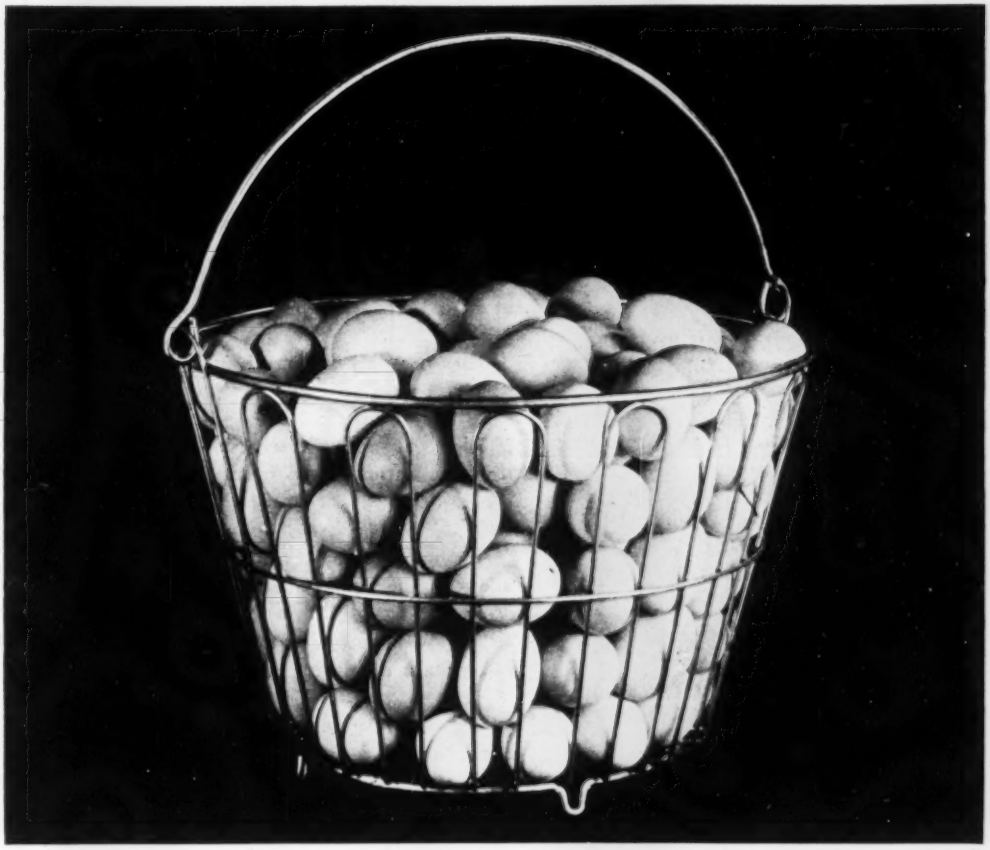
PUMPS — Integral motor and coupled types from ¾ in. to 72 in. discharge and up.

Texrope and Vari-Pitch are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-C

*Similar design non-ventilated motors Type APK, also available in frames 203 to 224 inclusive.



180 Eggs in a Bethanized Basket

Fifteen dozen eggs are an everyday load for this sturdy basket, made of Bethlehem's tough bethanized steel wire joined by 124 spot welds.

Egg baskets made this way have three advantages over the conventional wicker or reed types: (1) greater strength and rigidity, (2) longer life, (3) skeleton construction, permitting rapid cooling. The faster freshly-laid eggs can be cooled to room temperature, the longer they'll stay fresh. Bethanized wire provides all these advantages—plus a tight protective armor against rust.

More and more manufacturers, whether they make chain link fence or paper clips, are learning that bethanized wire helps solve forming and corrosion problems.

Bethanized wire's top feature is its zinc coating—99 pct pure, of uniform thickness, highly ductile, and tightly adhering to the steel base. Bend the wire, twist it, even draw it through a series of dies—the zinc doesn't crack, flake or peel. Rust won't find an opening in this perfectly bonded coating.

Bethanized wire can be supplied in the grade of steel to meet your product's specifications. Our nearest sales office will be glad to give you more information.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor*: Bethlehem Steel Export Corporation.

★ Bethanized Wire ★ BETHLEHEM STEEL ★

UNSURPASSED INSPECTION VERSATILITY

With Jones & Lamson Optical Comparators

PRODUCTION INSPECTION ON THE SPOT

TOOLROOM CHECKING OF EVERY KIND

LABORATORY GAGING WITH SPEED AND PRECISION

★ They meet the requirements of toolroom, laboratory and production inspection.

They precisely measure height, depth, lead or spacing, as well as angles to degrees and minutes.

★ They compare intricately contoured parts with a master outline – and measure the amount of error.

★ They are convenient to operate, easy to set up and read direct – without computation.

★ They will photograph the enlarged shadow and record its relationship to a master chart.

★ They will operate under normal lighting conditions. No dark room is needed.

★ Several persons may study the shadow at the same time.

★ They will inspect and measure surfaces, as well as profiles, of objects such as type faces, stamping dies, punches, worn tools, etc.

Jones & Lamson Optical Comparators are built in many models and sizes. We shall be glad to send catalog giving full details. Better yet, send us parts or prints with a description of your measuring and inspection problems – we shall be pleased to help.

Optical Comparator Division

JONES & LAMSON

MACHINE COMPANY
Springfield, Vermont, U.S.A.

Machine Tool Craftsmen Since 1835

STEEL

What deburrs clutch discs three times as fast?

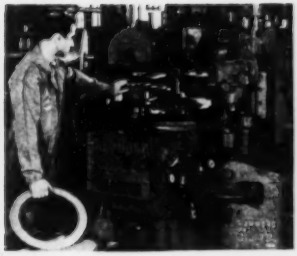
...a brush! To make tractor clutches operate smoothly, all burrs and sharp corners had to be removed by hand-filing and brushing the clutch disc teeth. Now, a five-station rotary automatic machine equipped with Osborn power brushes gets these results:

Triples output. Releases skilled personnel for other defense work. Assures uniform finishing of *every* disc for dependable clutch performance.

An **O**sborn **B**rushing **A**nalyst will gladly study your product-finishing and cleaning operations to suggest ways to speed production and cut costs. Call or write *The Osborn Manufacturing Company, Dept. 564, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

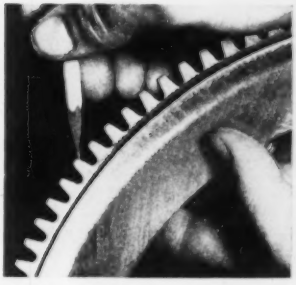
OSBORN

LOOK FOR THE NAME OSBORN . . . RECOGNIZED EVERYWHERE FOR QUALITY WORKMANSHIP AND MATERIALS



THE MACHINE... *a 5-head rotary automatic is used by this manufacturer to mechanize the brushing of clutch disc teeth. Each brush is powered by a 5 h.p. motor and rotates at 1750 r.p.m.*

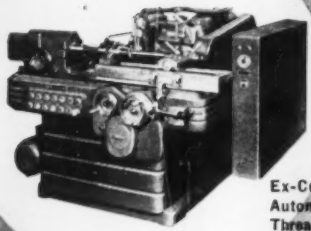
THE OPERATION. *Four of the stations brush across the teeth like the one shown above. Fifth station brushes* into *the teeth.*



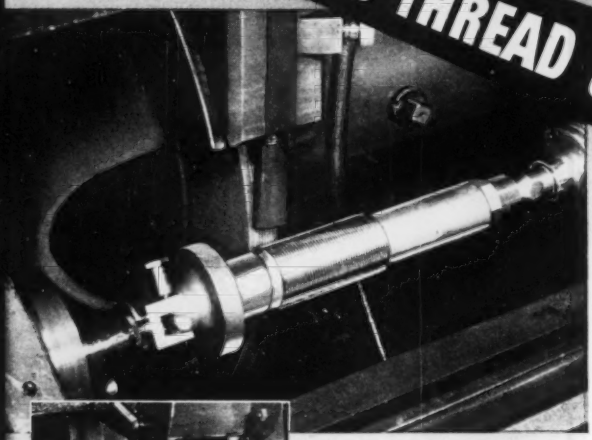
THE RESULTS. *Output is tripled. Manpower is conserved. Every disc is thoroughly and uniformly deburred. When clutches are assembled and tested, they operate smoothly and efficiently.*

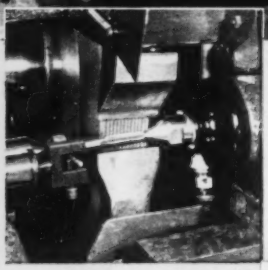
THE BUSIEST MACHINE IN YOUR SHOP

EX-CELL-O AUTOMATIC THREAD GRINDER



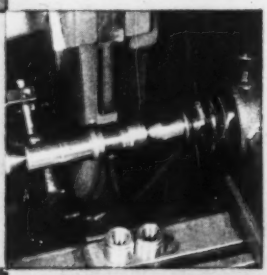
Ex-Cell-O Style 33 Automatic Precision Thread Grinder for external threads. Standard models for internal threads and universal models for both internal and external threads also are made by Ex-Cell-O.



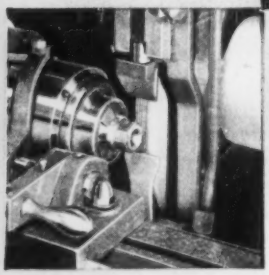


Grinding threads on cast-iron part with diamond dressed multiple-rib wheel on a Style No. 33 Grinder.

Skip-tooth diamond dressed multiple-rib wheel (wheel form is twice pitch of thread) grinding a ¼"—18 tap.



Threading stainless steel aircraft bushings on an Ex-Cell-O Style 33 Automatic Thread Grinder.



Grinding threads on the end of a machine gun barrel which is held within a special work head.

For high production with extraordinary precision, Ex-Cell-O Style 33 Automatic Thread Grinder is a popular choice. It is easy to set up and operate. With equipment for using multi-rib wheels, as shown in the accompanying photographs, output exceeds other methods.

Thread grinding is a must for hardened steel parts. More and more shop supervisors are discovering that grinding is also economical for materials that are tough and abrasive, or soft materials that are inclined to tear under the pressure of cutting tools.

For more information on thread grinding call your Ex-Cell-O representative or write directly to Ex-Cell-O. Please state whether you are interested in internal or external threads or both.

XLO

EX-CELL-O CORPORATION DETROIT 32 MICHIGAN

51-28

MANUFACTURERS OF PRECISION MACHINE TOOLS
CUTTING TOOLS • RAILROAD PINS AND BUSHINGS
DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

STEEL
The Weekly Magazine of Metalworking

VOL. 129 NO. 21 NOVEMBER 19, 1951

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Next Week ... **Sylvester Process Extracts Manganese from Slag ... Electronics in Metalworking ... Testing Organic Finishes ... Shell Molding—Advantages are Numerous**

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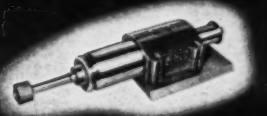
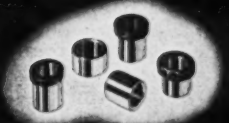
EX-CELL-O for PRECISION

PRECISION MACHINE TOOLS

CONTINENTAL CUTTING TOOLS

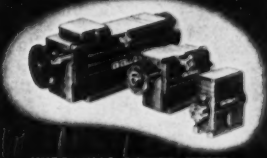


PRECISION GRINDING SPINDLES



DRILL JIG BUSHINGS

AIRCRAFT AND PRECISION PARTS



HYDRAULIC POWER UNITS

Products of
EX-CELL-O
CORPORATION
DETROIT 32, MICHIGAN

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Cleaning
of
WELDS
-
PELRON
KLEENWELD
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COMPOUND

prevents weld spatter sticking to metals.

—

- **Water soluble, for easy application.**
- **High heat resistant, will not smoke, has no flash point.**
- **Does not interfere with painting.**
- **Non-inflammable, non-toxic.**
- **Apply by brush, spray or dip.**

—

KLEENWELD is another PELRON product for better, easier metalworking, sharing the high acceptance of PELRON cutting, grinding, drawing and cleaning compounds.

Have you a problem involving these various processes? Tell us about it—possibly we have, or can develop, a product that will lick it!

Write the nearest PELRON office for free information and consultation.

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Behind the Scenes...

Cover Story

The handsome photograph on this week's cover was especially taken for us by Harris-Seybold Co. The Cleveland firm normally specializes in manufacturing printing equipment, but now is also producing machine tools on a subcontract basis.

Harris-Seybold also helped Assistant Editor Sam Baker a lot in preparing the machine tool subcontracting story to which the cover relates.

On Corn Cobs

We are in receipt of a release from the Office of Price Stabilization to the effect that corn cobs are now exempt from price control. Corn cobs, it seems, are a basic material used in furfural, and demand is sharply stepped-up for furfural. Furfural, we learn is used to make synthetic rubber, corrosion resistant equipment, naval stores and nylon.

The next time you see a good looking pair of nylons, remember that they owe their beginning to a corn cob.

Close Second

We thought for a minute we had finally found something to beat out the 28-letter antidisestablishmentarianism as the longest word in the English language, but on a recount we found we were mistaken. Our entry was dichlorododecafluoroheptane, but alas, it has only 27 letters. Antidisestablishmentarianism is the act of not subscribing to the dictum that the state and the church should be separate. Dichlorododecafluoroheptane is, we think, a chemical developed in connection with atomic energy program.

Noah Webster Won't Approve

We have never gone into the psychological aspects of the matter, but for some reason government people are agile word-coiners or renovators. Two new ones that are gaining circulation in Washington fall in the renovating category. They are "slippage" and "calibrate," two good words in their own right, but now considered in a new light. "Slippage" in the new jargon is the difference between allotments of materials and actual use of those materials. Agencies that don't use their full quotas of steel, for example, have slippage.

"Calibrate" has a new sense down in Washington when people there speak of "boron steels not calibrated for heat treating." We're not sure what it means, but it sounds fine.

We think the agencies ought to get cracking, calibrate that slippage, or we'll hit a slipe point, for sure.

Editorials

Requests are mounting for reprints of Editor-in-Chief Earl Shaner's various editorials. If you want some, contact Readers' Service Department, Penton Bldg., Cleveland 13, O. They cost $3 per 100. Larger quantities are slightly less.

While on subjects related to the boss men on the editorial side, we hear that Editor Irwin Such has just been elected permanent chairman of the Business Press Advisory Committee on Scrap. He heads a group dedicated to publicizing the seriousness of the scrap shortage and to pointing out in editorial columns the best ways to relieve it.

We Disagree

The Federal Reserve reports a nationwide shortage of small coins. We don't know about that. We always have a few pennies, nickels and dimes, but it's the folding stuff that we're short of.

Puzzle Corner

The original digits in the Nov. 5 puzzle were 15. First in with that answer were E. Buschow of Surface Combustion Corp., Paul E. Frantiz of Glendale, Calif., T. S. Bean of Barber & Ross Co. and Sidney Strauss of Automatic Firing Corp.

Since next Thursday will be Thanksgiving Day, it's only fair that we have a Thanksgiving puzzle. A woman in a poultry store bought a turkey for $3.50, but handed the clerk a check for an amount larger than necessary in payment. However, the clerk made an error, reading the dollars of the check for the cents and the cents for the dollars. After deducting $3.50, for the turkey, the customer was returned the true value of the check. What was the value of the check?

Shrdlu

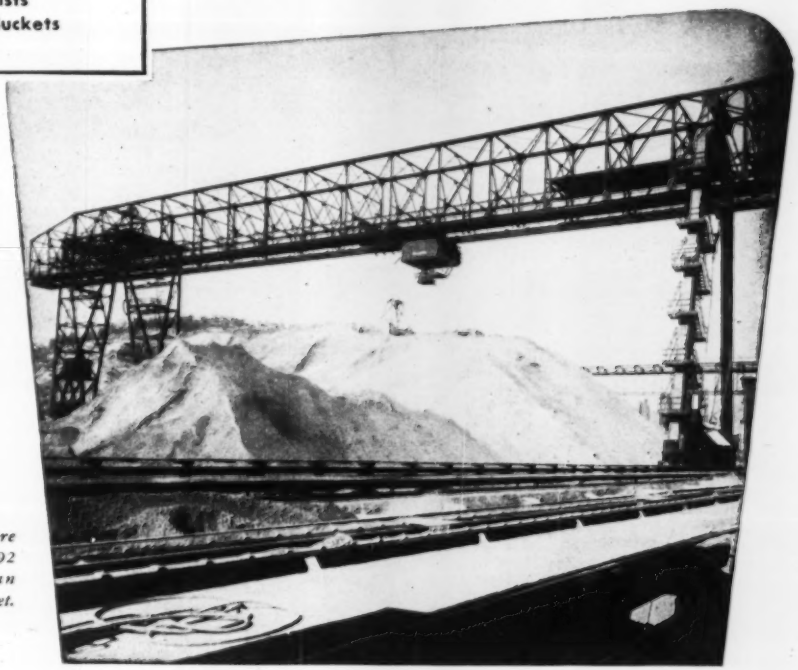
(Metalworking Outlook—Page 51)

Wellman will build it

Special Cranes
Ore Bridges
Gas Producer Plants
Charging Machines
Industrial Furnaces
Car Dumpers
Gas Flue Systems
Gas Reversing Valves
Coke Pushers
Mine Hoists
Skip Hoists
Clamshell Buckets

Wellman Ore Bridges

New 300 foot span!



Wellman 13¼ net ton ore bridge, fitted with 192 cubic foot Wellman Williams type ore bucket.

• This new installation, built for one of America's largest steel companies, embodies many engineering features which speed the handling of ore and curtail costs.

Wellman's half century of experience is at *your* service.

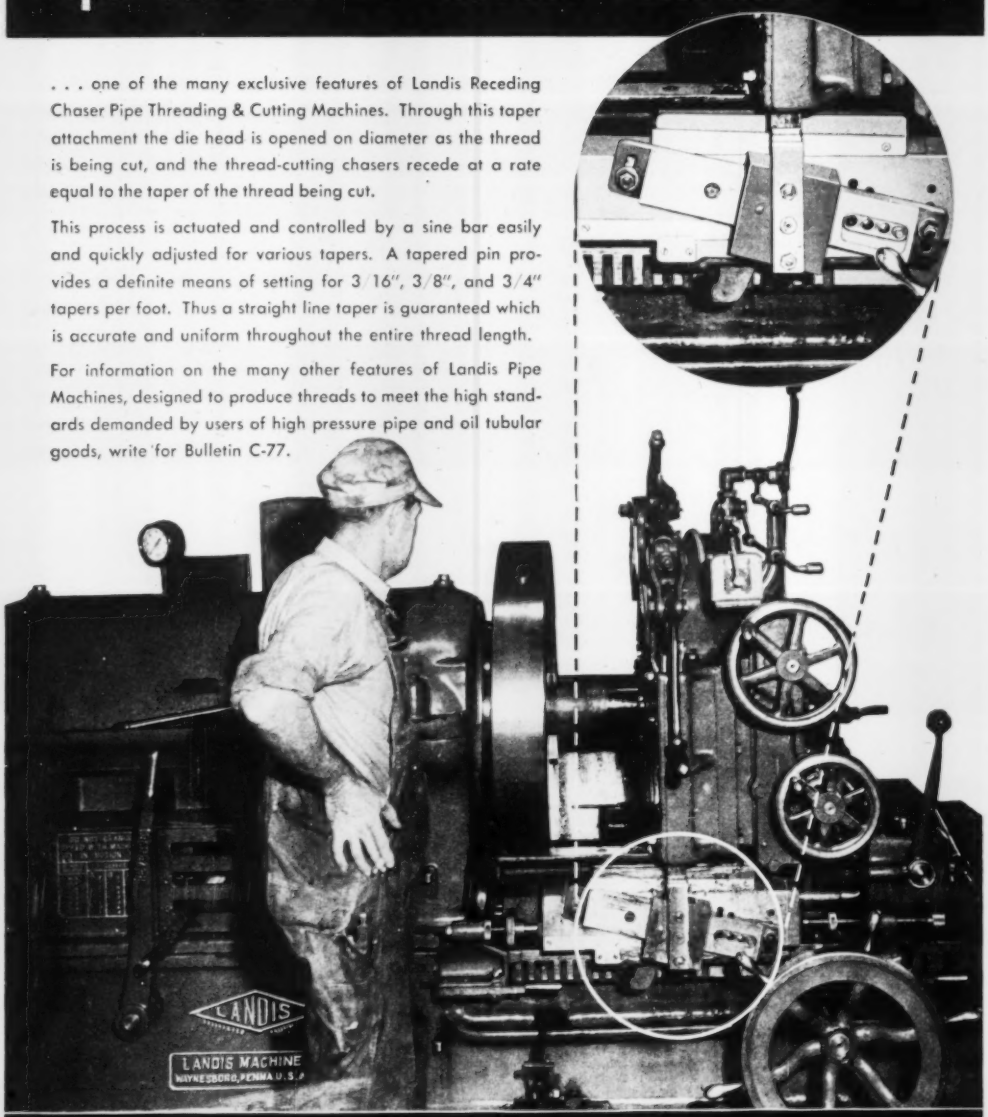
THE WELLMAN ENGINEERING COMPANY
7029 CENTRAL AVENUE • CLEVELAND 4, OHIO

Receding Mechanism Guarantees Tapered Pipe Threads To Closest Tolerances . . .

. . . one of the many exclusive features of Landis Receding Chaser Pipe Threading & Cutting Machines. Through this taper attachment the die head is opened on diameter as the thread is being cut, and the thread-cutting chasers recede at a rate equal to the taper of the thread being cut.

This process is actuated and controlled by a sine bar easily and quickly adjusted for various tapers. A tapered pin provides a definite means of setting for 3/16", 3/8", and 3/4" tapers per foot. Thus a straight line taper is guaranteed which is accurate and uniform throughout the entire thread length.

For information on the many other features of Landis Pipe Machines, designed to produce threads to meet the high standards demanded by users of high pressure pipe and oil tubular goods, write for Bulletin C-77.



LANDIS *Machine* COMPANY · WAYNESBORO PENNSYLVANIA

INSUL-MASTIC Coatings

As Spectacular as the jobs they serve

This huge steel monument looks out over seven counties in Pennsylvania, Ohio and West Virginia. The cross is the fulfillment of a dream of Reverend W. L. Hogg, D. D., of Uniontown. The man swinging in the sky is spraying it with a white Insul-Mastic coating to beautify and to prevent rusting.

A sixty foot steel cross on a Pennsylvania mountain top... giant fractionation towers in a Texas refinery... acid tanks in New Jersey... coking ovens in Maryland... the hydrogen bomb plant. In thousands of places like these, Insul-Mastic coatings insulate, vaporseal and prevent corrosion.

All Insul-Mastic coatings are homogenized and are manufactured with two particular objectives; to resist all corrosive agents... from moisture to acids... and to have exceptionally long life. In addition to these qualities, certain Insul-Mastic coatings contain cork and are excellent insulators. Other uses for Insul-Mastic are vaporsealing thermal insulation and moisture sealing building walls.

Insul-Mastic's outstanding quality is the reason for its place on the most spectacular... and exacting... projects where protection of metal, masonry or insulation is important.

Write for complete information and the name of our nearest representative.

Think first of the coatings that last!

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OF AMERICA
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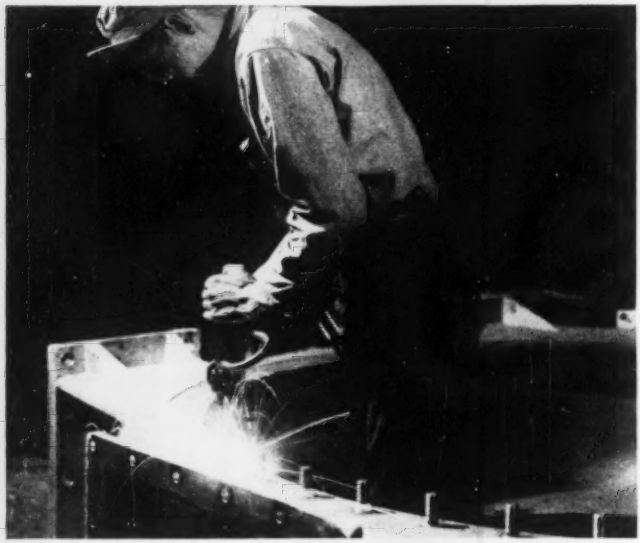
NELWELD CASE HISTORY IN HEAVY EQUIPMENT



Nelweld operator welding 7/8" dia. studs at a rate of 4 or 5 per minute on a mounting flange, of a coal pulverizer casing. Photo courtesy of Combustion Engineering-Superheater, Inc.

HOW TO SAVE 7 HOURS, 7 MINUTES IN AN EIGHT-HOUR DAY!

THE PROBLEM — How to cut down production time necessary for the installation of ninety-six 7/8" dia. studs on the mounting flanges of a large, heavy casing—requiring considerable labor and equipment time for handling, drilling, and tapping.

THE NELWELD ANSWER—One workman, using the light-weight Nelweld gun and Nelson granular flux-filled studs, end welds each stud in less than 20 seconds—*at least ten times faster than former methods!* He simply inserts the stud in the chuck, locates it on the work, and presses the trigger—Nelweld does the rest and the stud is set! *By time study comparison, the Nelweld Method did the same job formerly requiring eight hours in less than 54 minutes!*

THE RESULT—One man, working in one spot with a portable Nelweld unit, has released the equipment and manpower formerly required for the handling of ninety-six separate drilling, tapping and setting operations.

Change-over to the Nelweld method required only a minor investment, with immediate results in decreased production and fabricating costs. These same outstanding Nelweld advantages can prove valuable in your fabrication of equipment.

For complete information on the advantages of Nelweld as applied to your fastening techniques, contact the nearest Nelson office or write Department S-1, Lorain, Ohio.

Fasten it Better...at Less Cost, with NELWELD

NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

STEEL

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WHEEL 28" DIAMETER
SHAFT 5 FEET LONG
VALUED AT THIS POINT, AT NEARLY $4,000

No one likes to contribute to the scrap pile, especially when many parts represent a value of $2,000 to $4,000 at the time of broaching. You can avoid scrap, in many critical operations, by

LAPOINTE BROACHING

Lapointe has a wealth of broaching experience that cannot be found elsewhere. Lapointe, in fact, pioneered the broaching of difficult jet engine components. All of this accumulated engineering skill is at your disposal to solve today's tough production problems.

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REMEMBER ALWAYS:

1. Broaching gives you repetitive accuracy to close tolerances.
2. Broaching gives you production output greater than that of any other machining method.
3. Broaching is the surest way to save important metals.

The only SCRAP in BROACHING is the *CHIPS!*

Write for our folder on "Broaching." Ask for Bulletin BBV-3

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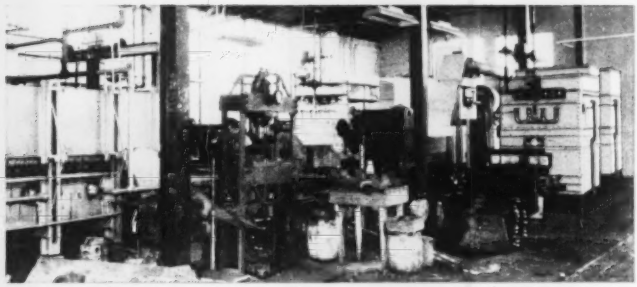

Niagara Aero Heat Exchanger quickly pulls down the initial peak load of heat in quenching . . . and saves cooling water

Accurate control of quench bath temperatures and quickly effective capacity to handle the initial peak load of heat in quenching prevents production set-backs, increases the output of your heat treating department, prevents oil fires, saves you losses from rejected parts.

Niagara Aero Heat Exchangers give you this control in both furnace and induction hardening methods. They prevent both over-heating and over-cooling of the quench bath. Hundreds of heat treaters know they prevent many troubles, constantly improve quality and increase production.

They quickly pay for themselves by saving cooling water coils and extend your quench capacity without extra water or cooling tower.

Write for Bulletin #120 giving complete information.

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Over 35 Years' Service in Industrial Air Engineering

Dept. S, 405 Lexington Ave. **New York 17, N.Y.**

Experienced District Engineers in all Principal Cities

LETTERS
TO THE EDITORS

Some Will, Some Won't

I was very interested to read the article entitled "Titanium Machines Like Jet Engine Alloys" in the Oct. 22 issue of STEEL. At the bottom of p. 75, following the reference to our brand name—Vasco Supreme High Speed Steel—you have parenthetically indicated it to be an 18-4-1 type. Such an inference is unfortunate, since 18-4-1 type high speed steels will not satisfactorily machine titanium, except in rare instances.

Vasco Supreme and its companion Vasco Supreme A, are super-high speed steels. These are high in carbon and vanadium content and as such have, in addition to high hot hardness; the highest wear resistance yet produced in a commercially forgeable material. To these qualities can be ascribed the ability of Vasco Supreme to successfully machine titanium and some of its alloys.

George A. Roberts
chief metallurgist
Vanadium-Alloys Steel Co.
Latrobe, Pa.

Correction, Please

In last week's issue of STEEL, the letter erroneously ascribed to Mr. A. F. Denham, Denham and Co., Detroit, Mich., was actually written by Mr. Robert W. Welch, Keystone Structural Steel Co., Trenton, N. J. Mr. Denham's letter to STEEL was as follows:

Very much interested in perusing your article on "Need Engineers?" in Oct. 22 issue of STEEL. I suspect that the Engineering Manpower Commission of the Engineers Joint Council did not include so-called production engineers (tool engineers) in their estimate and it is here that one of the biggest shortages occurs.

Major difficulty has been that colleges so far have not gone in very much for teaching production engineering. Biggest deterrent in adding curricula is the lack of availability of qualified teachers in this field. The American Society of Tool Engineers currently is trying to do something about it. Among other things the ASTE awards scholarships to students taking tool engineering courses of various kinds and has this year so far awarded four of them.

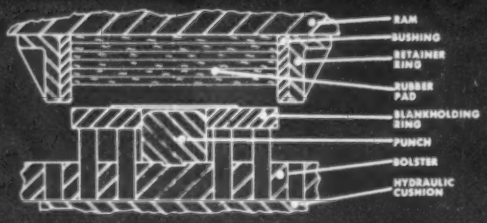
Athel F. Denham
Denham & Co.
Detroit

Made In England

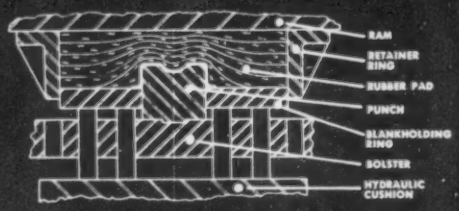
In the Aug. 20 issue of STEEL, p. 65, mention is made of a direct reading instrument for oxygen developed by a British instrument manufacturer. Can you give me the name and address of the British maker of this instrument?

William H. Pugsley
vice president—sales
Hays Corp.
Michigan City, Ind.

• *The instrument is a product of George Kent Ltd., Luton, Bedfordshire, England. It is called an oxygen analyzer and is now on the market.*

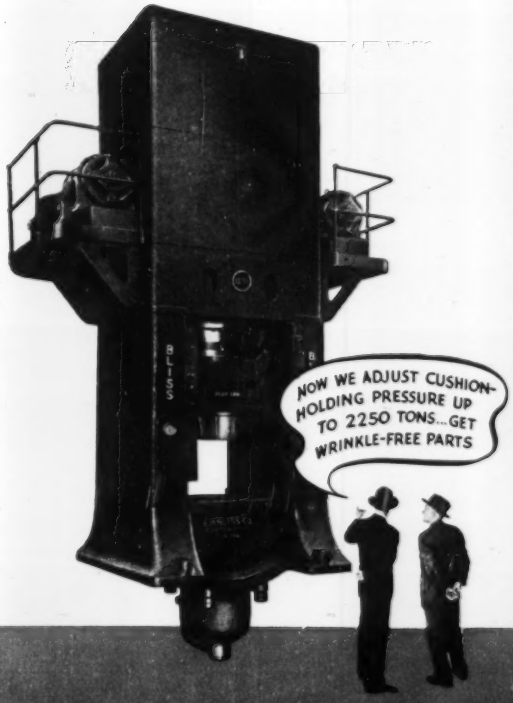


Rubber-pad draw die in open position on a single-action press with cushion: To provide higher pressure, pad area is decreased by inserting a bushing inside rubber retainer ring.



A double-action rubber-pad die in closed position: The high pressures, which rubber pad withstands, make possible production of reverse curves (like that at top of punch).

Deep, Complex, Wrinkle-free Shapes through Rubber-Pad Press Forming



You can now have short-run production of deep-drawn parts through rubber-pad forming—with substantial savings in tooling time and costs. Required heavy pressures are delivered by single and double-action hydraulic presses with a holding cushion in the bed and rubber pad on the slide. Compared with drop-hammer methods, the rubber-pad process offers a *better product at less cost.*

Airframe manufacturers, after experimenting with the double-action type of rubber die work, report pressures from 1500 psi to 4000 psi. In some instances pressures of 15,000 psi on the rubber itself are found desirable.

Highly versatile Bliss Hydraulic Presses with blank-holding cushions built into the bed and cushion capacities up to about ninety percent of the press rating, are available in a wide range of sizes. Flexible pressure controls to suit the work range are furnished. The rubber pad and retaining ring of suitable dimensions may be ordered with the press. Submit samples or part prints. Bulletin 39 gives a description of the process.

E. W. BLISS COMPANY, CANTON, OHIO

Mechanical and Hydraulic Presses, Rolling Mills, Container Machinery

From the right press for a given job... to a complete press room... **It's Bliss!**

700-Page Handbook Tells How to Use Presses Efficiently

Bliss Power Press Handbook, 450 illustrations. Sections on: Easy methods of computing press jobs • How to select proper press • Engineering tables • Die illustrations • Glossary of terms. Plus service section on all Bliss presses. Price $7.50

E. W. Bliss Company—Handbook Dept., Canton, O.

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DIVISIONS OF
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What are your salesmen doing these days?

This question is being asked of us pretty frequently.

Actually our "salesmen" are 45 factory-trained machine tool specialists . . . field engineers whose most important job today is to help you increase production for defense in every way they can. For instance:

1. *To help you select the type and size turret lathe, automatic or tapping machine for your job.*
2. *To see that you have and use the right tools with your present machines.*
3. *To make sure that you buy no more machines or tooling than necessary.*
4. *To help you reconvert your present machines.*
5. *And, as always, to recommend the machine you need—even if it* ISN'T *a Warner & Swasey.*

Busy as he is, your Warner & Swasey Field Engineer will be glad to help you whenever he can. He's a good man to know these days. Get in touch with him when you have a machining problem.

WARNER & SWASEY
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES

FERRACUTE

NEW-DESIGN OPEN-BACK

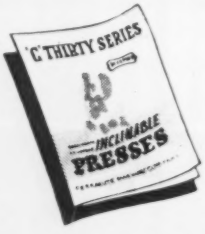
INCLINABLES

A Complete Range of Models from 6 to 200 tons

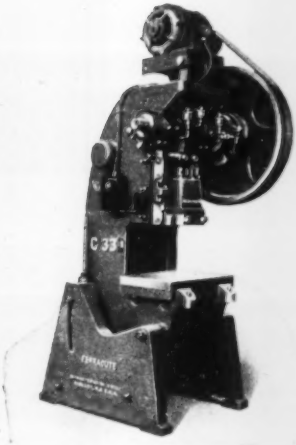
Re-designed, with many improvements and refinements, including completely replaceable V-shaped gibs, having either positive or air friction clutch. Designed to take any type of automatic or semi-automatic feed attachments.

VERSATILE — DURABLE — ECONOMICAL

The very complete range of models, geared and non-geared, enables a choice of the size that will produce greatest efficiency and economy for any given purpose. Prompt, dependable delivery.

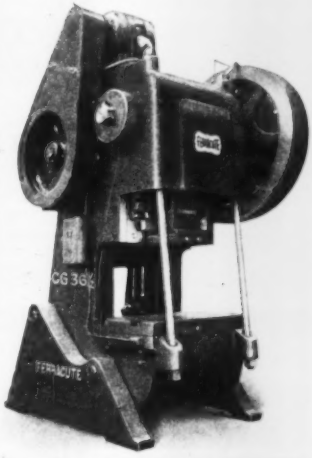


Write for latest brochure and dealer's name in your territory.



32-tons

Fly-wheel type press C-33. Knockout in ram, positive clutch, V-belt motor drive, standard lubrication.



150-tons

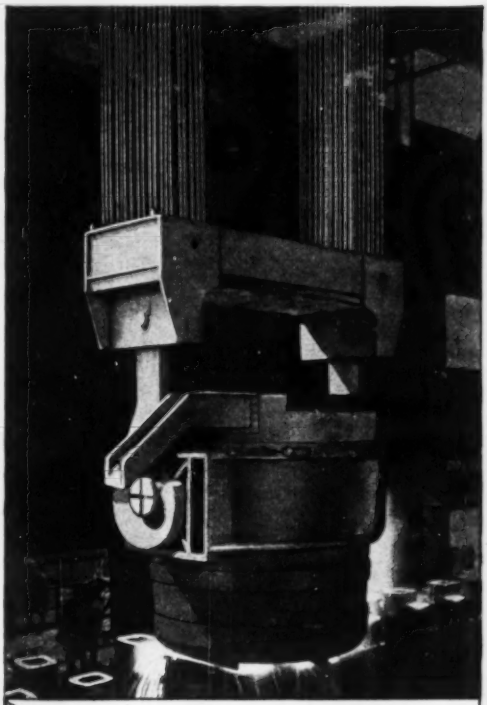
Geared press, CG-36½. V-belt motor drive, bolster, stay rods, air friction clutch, and Farval centralized lubrication.

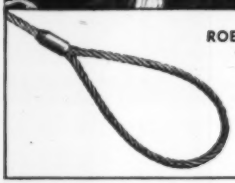
FERRACUTE MACHINE COMPANY

Bridgeton, New Jersey, U.S.A.

Since 1863, Manufacturers of power presses and special machinery

WIRE ROPE





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Roebling "Blue Center" Preformed works better . . . lasts longer . . . cuts costs

"BLUE CENTER" STEEL wire rope is an exclusive Roebling development. Its high resistance to abrasion, shock and fatigue spells long life. In addition, Roebling Preforming gives you a rope that is easy to handle . . . has better spooling qualities . . . reduces vibration and whipping. This combination makes Preformed "Blue Center" Steel Wire Rope a top performer on the job.

Roebling makes a complete line of wire rope . . . there's a construction for every installation. Have your Roebling Field Man help choose the *right* rope for your equipment. Get his advice on the correct use and maintenance of wire rope. It is based on performance records on thousands of installations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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They never miss this HEADLINE

and the savings in time — and screws — make news wherever they see it on P-K Size-marked Gear Grip Socket Head Cap Screws

The SIZE-MARK on Parker-Kalon Socket Head Cap Screws is something no workers can miss, whether they are beginners or veterans.

When they see it, errors and confusion are avoided. Sizes are issued correctly, used correctly—there's no time wasted checking and changing, no spoiled work.

In the tool-crib, the P-K Size-mark speeds up sorting of left-over, mixed screws, without the bother of "miking" or gauging. It puts screws back in use that might otherwise be discarded because sorting is "too much bother".

Only Parker-Kalon offers the Size-mark and Gear Grip on Cap Screws. They are wanted, in tremendous quantities, for more of industry's finest products than ever before. For DO or other assemblies, set your standards by P-K quality. Your P-K Distributor will apply his long experience to your most difficult problems of planning and procurement.

IF IT'S P-K IT'S O.K.

Parker-Kalon Corporation, 200 Varick Street, New York 14, New York.
Sold through Accredited Distributors.

PARKER-KALON®

Cold forged

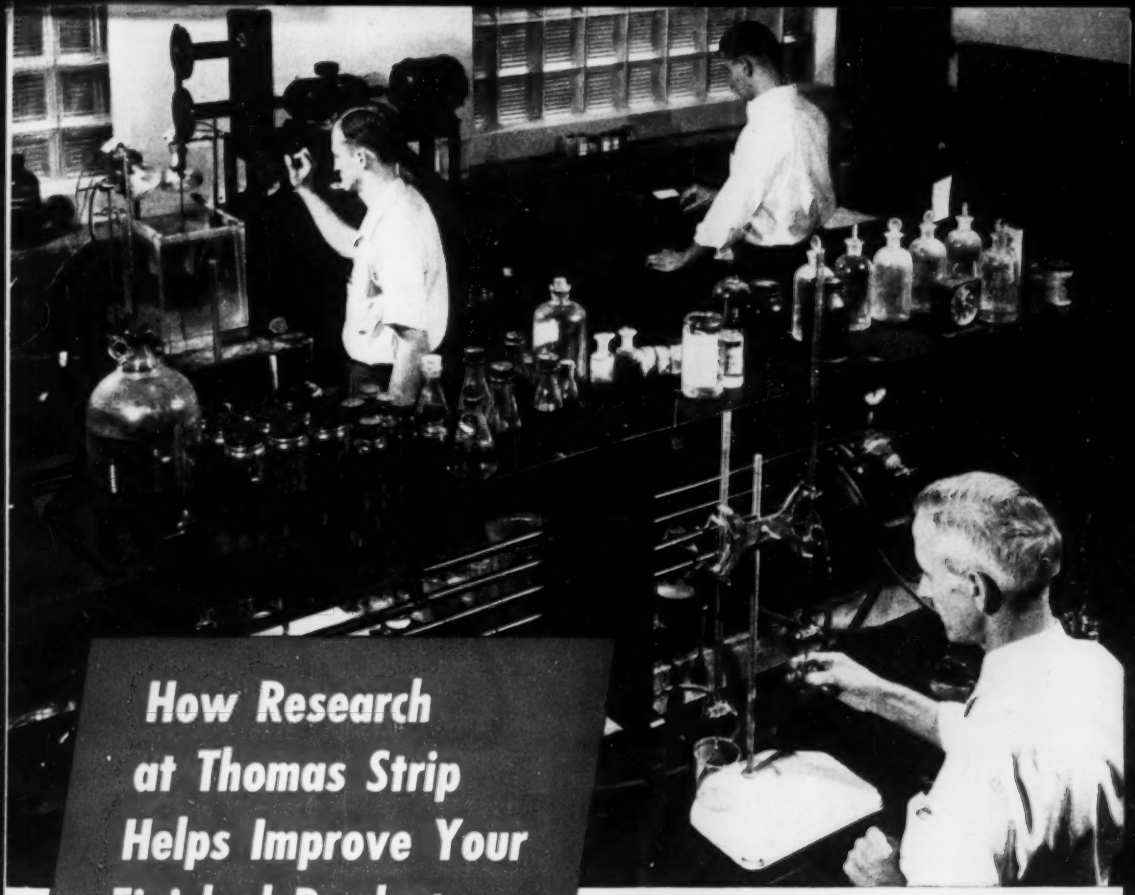
SOCKET SCREWS

SIZE-MARKED SOCKET HEAD CAP SCREWS • GROUND THREAD SOCKET SET SCREWS
FLAT HEAD SOCKET CAP SCREWS • STRIPPER BOLTS • PIPE PLUGS • HEX KEYS

MORE HELP FOR ASSEMBLY PLANNERS

The New
P-K Socket Screw Dimension Finder

A pocket-size plastic slide chart gives you all essential dimensions of P-K Socket Cap Screws, Set Screws, Flat Head Socket Cap Screws, Stripper Bolts, and Pipe Plugs. Includes Set Screw Point Dimensions, and Thread Length Formula. Available, FREE from your P-K Distributor.



How Research at Thomas Strip Helps Improve Your Finished Products

This is part of the plating research laboratory at the Thomas Strip Division of Pittsburgh Steel Company. Many specialized problems are solved—new ideas developed here.

Research has done many things at Thomas Strip — prime example of which is a unique method of pre-coating strip steel.

The use of Thomas Strip by many manufacturers has resulted in the elimination or reduction of plating costs—given their product an inside-and-out quality finish—protected their products from corrosion — eliminated several steps in a process cycle—saved them handling, preparation and cleaning costs. These are some of the advantages you enjoy by use of Thomas Strip which is pre-coated electrolytically with zinc, copper, brass, nickel and chromium. It is also hot dip tin and lead alloy coated and lacquer coated in a variety of colors to best suit your requirements.

The benefits of using pre-coated Thomas Strip have been made possible through intensive research and development work performed over the years in the laboratory and on pilot plating lines by Thomas technicians. Their accumulated knowledge, skill and experience applied to specific problems has made possible the manufacture of better products at lower costs—the conservation of scarce and critical materials.

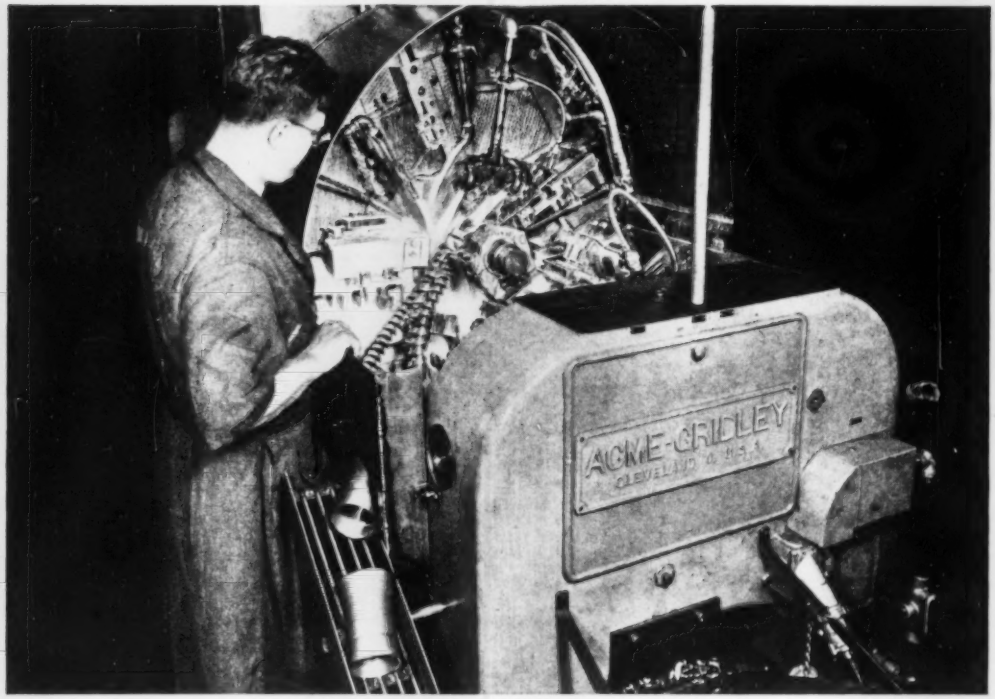
While the accomplishments of the research staff have been many, they continue painstakingly with their work in order to progress even further in the field of pre-coating. Specific problems presented to them by customers must be solved—new products developed—new techniques created—all directed toward the one goal of helping improve your finished products by making the use of Thomas Strip practicable in your operations.

Thomas Strip

a product of

Pittsburgh Steel Company

Pittsburgh, Pa.



FOR MORE PRODUCTION (and PROFIT) ON MUNITIONS PARTS

We can help you cut machining costs on munitions parts.

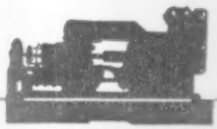
National Acme engineers have worked out standardized tooling and production methods for many of them, taking advantage of the faster setup and machining times possible on the versatile, new Acme-Gridley Model M Single Spindle Automatic. That way, you're ready to go right into production with no educational orders, trial setups or experimental tooling.

So you start out with a saving—and you'll save through the heavier feeds, faster speeds and closer tolerances you get on a Model M. You can have the advantage of faster production through fully automatic operation on a broad variety of parts and lot sizes. On the job illustrated, for example, machining time was cut 50%, using exceptionally heavy feeds and faster speeds.

Interested? Let us show you how the Model M can raise production—and profits—in *your* plant.

JOB FACTS

PART	Collet Blank
MATERIAL	A-1160 Steel
MACHINE	$4\frac{3}{4}$" Acme-Gridley Model M Single Spindle Automatic
OPERATIONS	14, including heavy drilling, light forming and turn and finish bore.
TOOLS	Carbide and High Speed Steel
TIME	17 Minutes
SAVING	Machining time cut 50%



ACME-GRIDLEY BAR and CHUCKING AUTOMATICS built in 1, 4, 6 and 8 spindle styles, maintain accuracy at the highest spindle speeds and fastest feeds modern cutting tools can withstand.

THE NATIONAL ACME COMPANY

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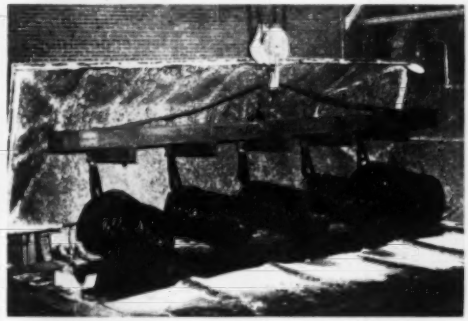
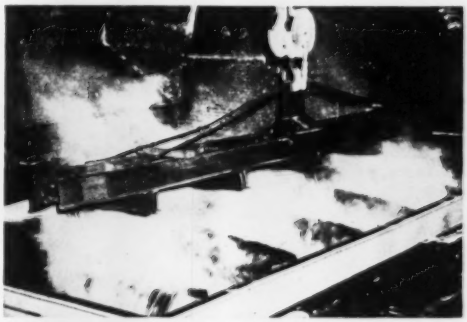
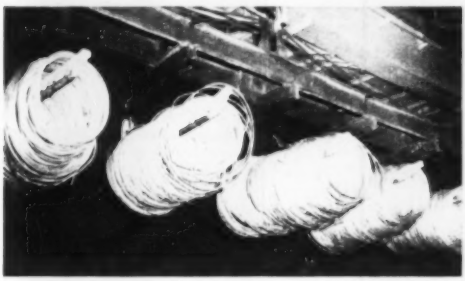
Descaling 5 tons of stainless wire *IN 15 MINUTES* with VIRGO® Descaling Salt



10-MINUTE IMMERSION in molten bath of Virgo Descaling Salt at 900°F. loosens scale. The bath is self-regenerating, and produces no toxic fumes. Immersion time and temperature are flexible, need not be watched closely.



WATER QUENCH removes much of the loose scale. The steam generated by immersing the hot metal in the water further loosens scale by its blasting action. The work is thus prepared for the final acid dip.



THREE-MINUTE DIP in dilute acid removes the now soluble scale. The work is ready for a rinse or hosing to wash off the acid. **Result: a chemically clean surface—no pitting, etching or metal loss.** TOTAL TIME—15 MINUTES.

VIRGO DESCALING SALT—Producers and fabricators of stainless and alloy steels use Virgo Descaling Salt to quickly, positively remove scale produced by hot rolling, forging, extruding, casting, annealing.

VIRGO MOLTEN CLEANER—quickly, positively desands and degraphitizes castings; removes grease, dirt, chemicals, paint, enamel, rubber, atmospheric corrosion and other impurities.

This process can be used on steel; castings; forgings; fabricated parts; material to be salvaged. It employs simple equipment, and is easily adapted to your production methods.

SEND FOR THESE BULLETINS—Get the whole story on Virgo Descaling Salt and Virgo Molten Cleaner—what they are, how they work, their advantages, how they fit your operations, and the Hooker services you enjoy as a user of the process. Send for these bulletins today.

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From the Salt of the Earth

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Please send me Bulletins checked: Virgo Descaling Salt ☐ Virgo Molten Cleaner ☐

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IT TAKES MORE THAN PLEDGES..

It takes ACTION
TO GET THE SCRAP

Remember: If we don't get the scrap—
— We won't get the steel!

Your Plant and Every Plant in Every Industry in America can cooperate with the Steel Industry Scrap Mobilization Committee by

1. Organizing an intra-plant clean-up committee.
2. Locating every item of worn out, obsolete or discarded metal.
3. Rushing every pound of available discarded metal to the scrap market.
4. Putting it's scrap location search on a permanent housekeeping basis.

Cooperate with your local Scrap Mobilization Committee.

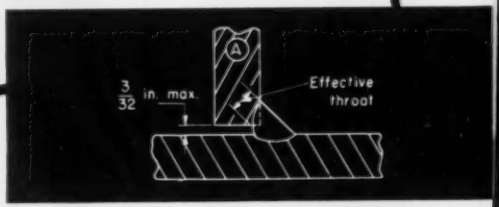
THIS ADVERTISEMENT—PUBLISHED IN THE INTEREST OF THE NATIONAL WELFARE BY

The Cleveland-Cliffs Iron Company

CLEVELAND, OHIO

Here's How To Assure Good Welding Fit-Up

Copyright, 1951, General Electric Company



GOOD PRACTICE—Full throat size and strength are obtained when the fit-up gap is as much as 3/32 inches. The deposit penetrates the corner of Plate A as much as 3/32 inches. Larger gaps require excess welding.

SAVE TIME, POWER, ELECTRODES USE GOOD TECHNIQUES AND THE RIGHT ELECTRODE FOR THE JOB

Improper fit-up of joints to be metal arc-welded can slow production, waste man-power and electrodes, and increase costs at a tremendous rate. This is especially true of fillet welds on which the size of the fillet must be increased to compensate for poor fit-up if the joint is to have full strength.

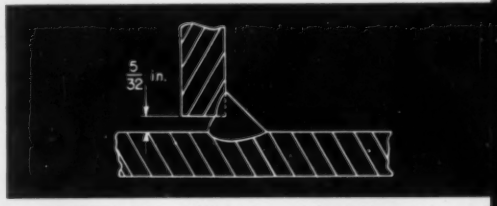
TO ASSURE GOOD FIT-UP:

1. DESIGN JOINTS CAREFULLY—give careful consideration to the type and size of joints to be welded; simplify fit-up by eliminating irregular contours wherever possible.

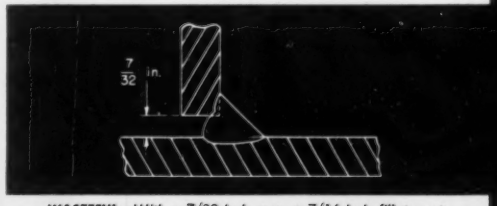
2. ALLOW FOR DISTORTION—otherwise excessive gaps may appear in the fit-up of unwelded joints as assembly progresses.

3. CUT AND SHAPE PARTS ACCURATELY—inaccuracy which results from haste or the use of machines improperly adjusted or in need of maintenance is one of the greatest single causes of poor fit-up.

4. WELD IN PROPER SEQUENCE—weld least-contracting joints last, divide weldments into sub-assemblies, and weld outward from the center of a rigid structure.



WASTEFUL—With a 5/32-inch gap, a 3/8-inch fillet must be made to produce the strength of a 5/16-inch fillet. This requires approximately 50 per cent more time, power and electrode.



WASTEFUL—With a 7/32-inch gap, a 7/16-inch fillet must be made to produce the strength of a 5/16-inch fillet. This requires 100 per cent more time, power and electrode.

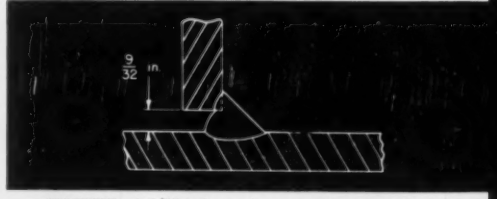
To Assure Yourself of the Best in Electrodes:

Insist on G-E electrodes. They give you high deposition rates, meet AWS specifications, and are available in a wide variety of sizes and types.

NEW! WELDING ELECTRODE SLIDE COMPARATOR

tells in an instant the AWS designation of manufacturer's electrodes.

See your G-E Welding Distributor for your comparator. Look for General Electric under "Welding Equipment" in the yellow pages of your telephone directory. And remember, he carries a complete line of G-E welders, electrodes and accessories.



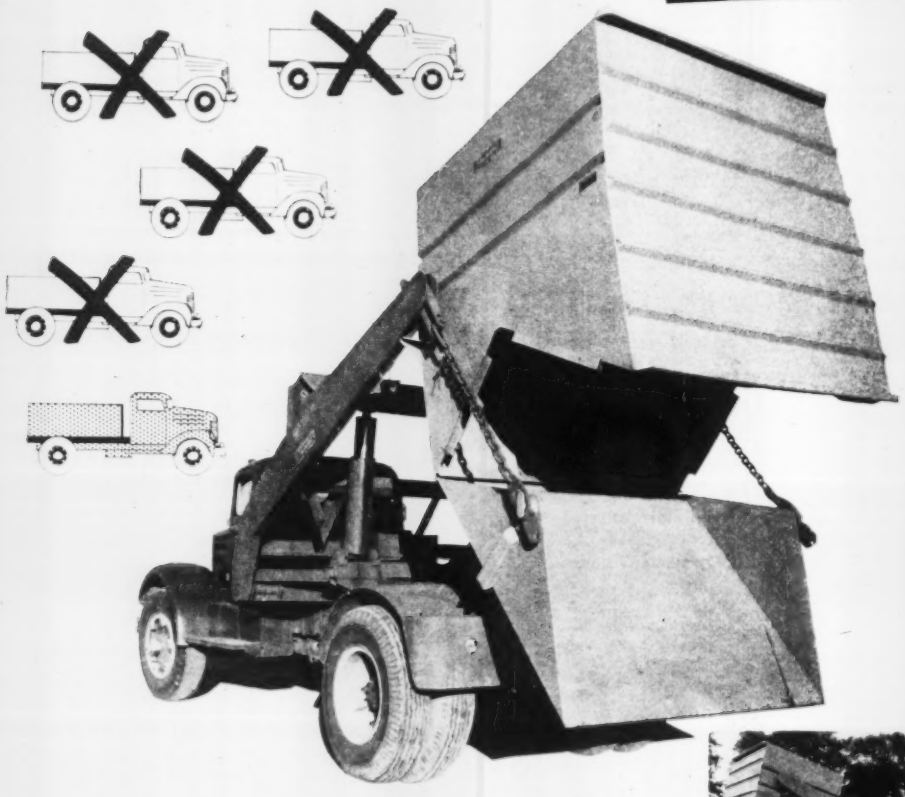
WASTEFUL—A 9/32-inch gap is a condition that ordinarily requires reassembling. If not refitted, it will require 200 per cent more time, power and electrode to produce the strength of a 5/16-inch fillet.

GENERAL ELECTRIC

712-10

You Can Do The Work of 3 to 5 Conventional Trucks With Only One

DEMPSTER DUMPSTER
TRADE MARK REG.



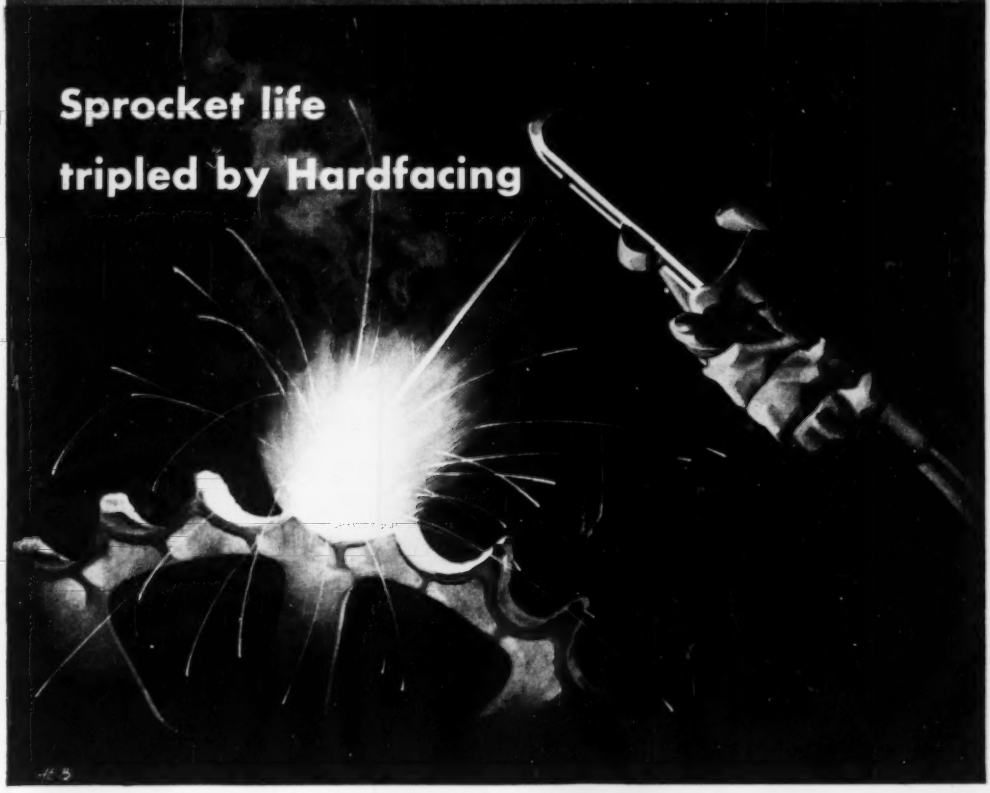
In many plants handling materials by the Dempster-Dumpster System, one truck-mounted Dempster-Dumpster, operated by only one man, the driver, has replaced 3 to 5 conventional trucks and crews. One Dempster-Dumpster services a multiple number of detachable containers in a wide variety of designs best suited to the type of materials handled—be they bulky, light or heavy . . . solids or liquids . . . trash or rubbish. Containers are conveniently located at accumulation points inside and outside buildings. The Type LFW Dempster-Dumpster shown above handles containers up to 12 cu. yds. Containers up to 21 cu. yds. are available with our Type ARLF and DTLF Dempster-Dumpsters. Without question, the Dempster-Dumpster System is the most economical and most efficient method of plant materials handling by truck yet devised! Write today for complete information. Manufactured exclusively by Dempster Brothers, Inc.

DEMPSTER-DUMPSTER, operated by means of hydraulic controls in cab, picks up each container, hauls and empties it or sets load down intact.

DEMPSTER BROTHERS, 6111 Dempster Bldg., Knoxville 17, Tenn.

ANOTHER AMERICAN Brake Shoe COMPANY PRODUCT THAT CUTS THE COST OF WEAR

Sprocket life tripled by Hardfacing



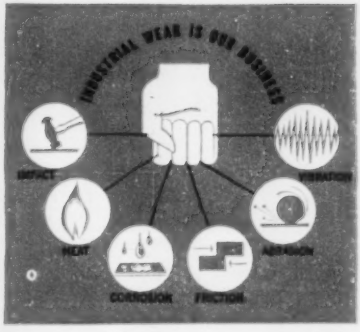
Repair instead of replace . . . on the job . . . at less cost

The sprockets that give 20-ton bulldozers their herculean push take a hard fisted beating as they slam into the track that moves the monster. Add to this destructive action, the gouging and cutting of sharp edged sand and stone, and you have wear at its worst.

Hardfacing . . . the laying of a hard, tough, wear-resistant metal surface on a softer base metal, by gas or arc welding . . . is a cost-cutting answer to this wear problem. It makes parts hard, yet tough, to resist the wear of impact, abrasion, corrosion and heat.

Amscoating is a method of hardfacing that often reclaims such worn out parts for less than original cost. It lengthens the life of old or new parts often beyond original service. Amscoating can be done in the field and on the job quickly and cheaply by any competent welder.

Amscoating is based on the know-how derived from thousands of practical field applications, with directly traceable savings in lower maintenance and replacement costs, and fewer shutdowns. Our Amsco engineers will welcome the opportunity to apply their experience to your hardfacing problem. Write Department G for literature about Amsco Welding Products.



AMERICAN Brake Shoe COMPANY
230 PARK AVE, NEW YORK 17, N.Y.

10 Divisions of American Brake Shoe Co. produce wear-resisting parts in 35 American and Canadian plants.

AMERICAN BRAKEBLOK DIVISION • AMERICAN FORGE DIVISION • AMERICAN MANGANESE STEEL DIVISION
BRAKE SHOE AND CASTINGS DIVISION • ELECTRO-ALLOYS DIVISION • ENGINEERED CASTINGS DIVISION
KELLOGG DIVISION • NATIONAL BEARING DIVISION • RAMAPO AJAX DIVISION • SOUTHERN WHEEL DIVISION

Copyright 1951, American Brake Shoe Company

Here's the new DINGS "standard" for Lifting Magnets

LOOK RIGHT for the features that make this new all-welded Dings the answer to a crane operator's prayer. It's the most advanced magnet on the market — the biggest lifting magnet development in years. Back of it is Dings' 52 years' experience as the world's largest exclusive builder of magnetic separators and lifting magnets for all industry.

Let the Dings' Representative nearby tell you how the many exclusive Dings' features mean dollars to you. Call him up.

FEATURES

1. LIGHT WEIGHT — up to 21% lighter in some sizes than any other magnet. More of the weight your crane carries will be payload.
2. ALL WELDED CONSTRUCTION—greater shock resistance, moisture-proof.
3. MORE LIFT — after a full day's operation, size for size the new Dings will lift from 10 to 100% more than any other. This is due to (1) its extremely low temperature rise and (2) a properly balanced magnetic circuit.
4. FOUR POINT CHAIN SUSPENSION — less swinging and "tipping" when picking up a load not properly centered — added chain life.
5. EXTRA HEAVY REINFORCED MANGANESE COIL SHIELD — strength where it's needed—25% more protection for the coils.
6. HEAVY LUGS for tag line or drag line service.
7. LEAD CABLE PROTECTED by a metal shield. Cable connection at the center of the magnet body.
8. WATER PROOF, SHATTER PROOF jerk resistant molded neoprene neck cable connectors.
9. TAMPER PROOF sealed terminal box.
10. ALLEN-BRADLEY controls.

DINGS MAGNETIC SEPARATOR COMPANY
4710 W. Electric Ave., Milwaukee 46, Wis.

Dings Magnets

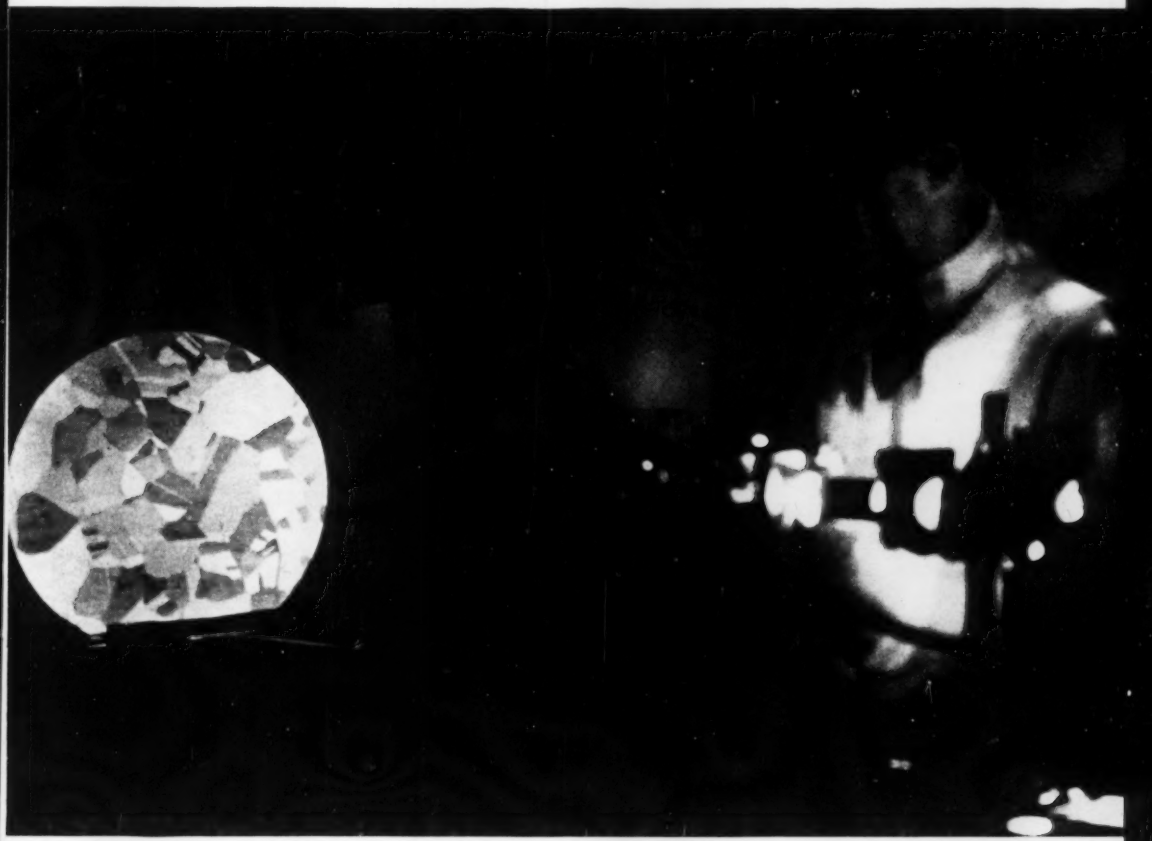
World's Largest Exclusive Builder of Magnetic Separators and Lifting Magnets

SEND FOR LIFTING MAGNET CATALOG

gives full description, sizes, capacities, etc.

Cross-section of a Satisfied Customer . . .

this is exactly what you are looking at in this (or any other) slide projected from a laboratory specimen in the Bristol Brass mills. This accurate determination of grain size makes certain that customers' specifications are being met *precisely*, for any alloy desired in any order for Bristol Brass sheet, rod, or wire. The Bristol Brass Corporation, since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.



"Bristol-Fashion" means Brass at its Best

READ THIS LETTER FROM A TYPICAL "E" STEEL CUSTOMER

J&L STEEL

check these points

...l Screw Products Compa...
INC.

...ttle
... & Laughlin Steel Corporation
...s & Laughlin Building
...tsburgh, Pa

Dear Sir:

We regret having been so slow in replying to your recent letter, but will attempt to give you some of the information for which you requested in regards to our experience with J&L E-33 steel.

We used a 1" R.A.6 Acme Gridley Automatic Screw Machine; the indexing time is approximately 1 second.

We are making a small Hub which is Drilled, Co. Bored, Formed and Tapped, but the time of the operation is limited to the time required to Drill and Co. Bore. We use a 5/16" cam on the tool slide for this operation.

Stock size is 5/8" Rd. on B-1113 C.R.S. We ran 1300 R.P.M. and used a feed of .003" per revolution.

On E-33 steel we were able to run 1800 R.P.M. and use a feed of .0035" per revolution, which resulted in a net savings of 2 seconds per piece or 33%.

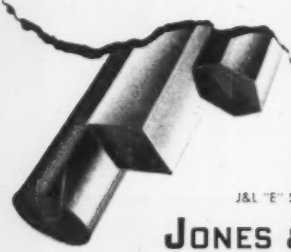
At this speed on the E-33 C.R.S. we found the finish on the part to be better, the tool life longer by approximately 50% which greatly reduced our down time for tool changes and reduced our rejections as well.

We took the job during a period when things were very competitive and work was scarce, and actually took this work on almost a break even basis, with our cost based upon using B-1113 C.R.S. But when we started using the E-33 C.R.S., we found that instead of having a dollar trading job on our hands we had converted it into a very good piece of business indeed.

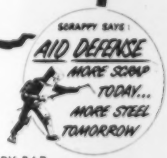
We have also used this E-33 steel on various other parts in sizes ranging from 1/4" dia. to 2 11/16" dia. and it is our opinion that, if the full advantage of the increased machinability is taken, the savings obtained more than offsets the increased costs of this type material even in the larger sizes.

In closing we have only one serious complaint to register and that is, why isn't there more of it available?

Very truly yours,



You can get real economies too by using J&L "E" Steel. Send for a free copy of our book, "A Progress Report on 'E' Steel." It lists grades available, physical properties and tells how others have used free-machining "E" Steel to advantage.



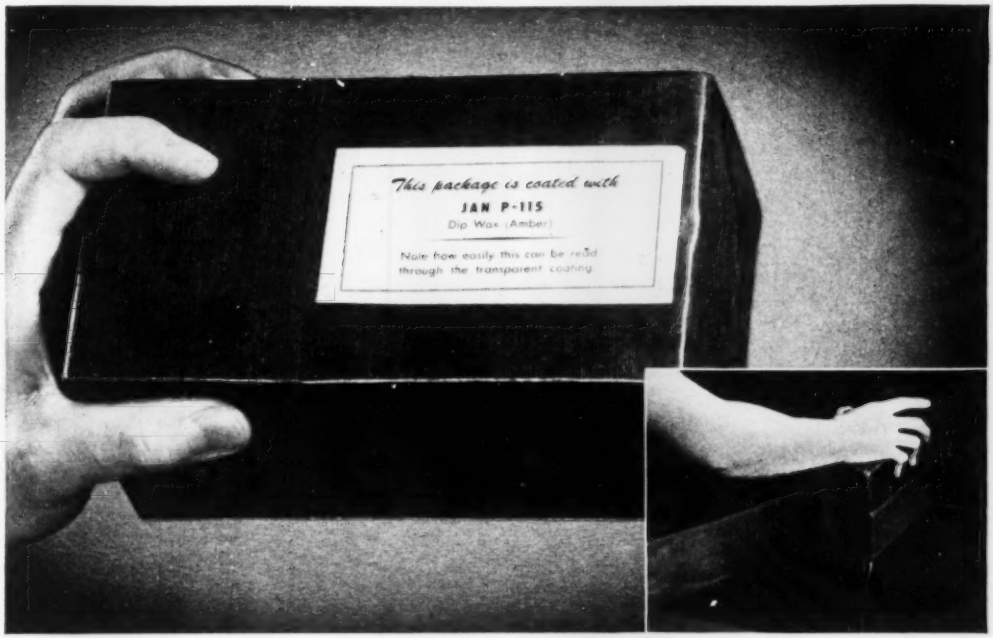
J&L "E" STEEL IS EASILY IDENTIFIED BY THE DISTINCTIVE BLUE COLOR ON THE END OF EVERY BAR.

JONES & LAUGHLIN STEEL CORPORATION

404 JONES & LAUGHLIN BUILDING PITTSBURGH 30, PA.

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY and JALLOY (hi-tensile steels).

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS STRUCTURAL SHAPES • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS



packaging headquarters
for government specified materials

The large unretouched photograph above displays a package that has been coated with government specified JAN-P-115 Amber by the dip-seal method. Note the complete legibility of the label.

This is but a single example of the Dearborn line of government specified packing materials that are uniform in quality . . . easy to apply to the products you manufacture. Whether your government orders require rust preventives, case liners, fingerprint neutralizers, wrappers and sealers, Dearborn has them. And, in addition, a Dearborn packaging engineer will gladly visit your plant and help you plan your packaging operation.

This service is designed for any manufacturer . . . but particularly for those with government contracts for export shipment. The coupon is for your convenience.

DEARBORN CHEMICAL COMPANY

Merchandise Mart Plaza • Chicago 54, Illinois

THIS BOOKLET WILL HELP YOU

The new edition of "Preventing Corrosion in Export Packaging" gives you: (1) current government specifications; (2) cleaning methods; (3) approved packaging methods; (4) how to apply rust preventives; (5) how to wrap, seal and dip parts; and (6) other valuable information with step-by-step picture stories. Write for it today.

Dearborn Chemical Company, Dept. S
Merchandise Mart Plaza, Chicago 54, Ill.

☐ Please send a copy of "Preventing Corrosion in Export Packaging."

☐ Have a Dearborn Packaging Engineer call.

Name.....

Company.....

Title.....

Address.....

City..... State.....

Dearborn
Reg. U. S. Pat. Off.

NO-OX-ID
IRON + OX = RUST

THE ORIGINAL RUST PREVENTIVE

America needs your daily pound of scrap

IF every man, woman and child in America provided one pound of scrap each day, they would supply just about enough to produce the 105 million tons of new steel that the industry hopes to make in 1951.

Like yeast in breadmaking, scrap is essential to steelmaking. Scrap speeds up the process because scrap is already-refined steel. Every ton of scrap used replaces one ton of pig iron. Thus scrap also saves raw materials, because each ton of pig iron represents two tons of iron ore, one ton of coal and half a ton of limestone.

The continuing co-operation of every reader of this page is urgently requested to overcome a scrap shortage daily growing more critical. Turn in--by selling your scrap to regular scrap-gathering channels--any and all broken, worn-out or obsolete things made of iron and steel--machines, tools, pipe, boilers, structural parts and other "junk" you'll probably never use again.

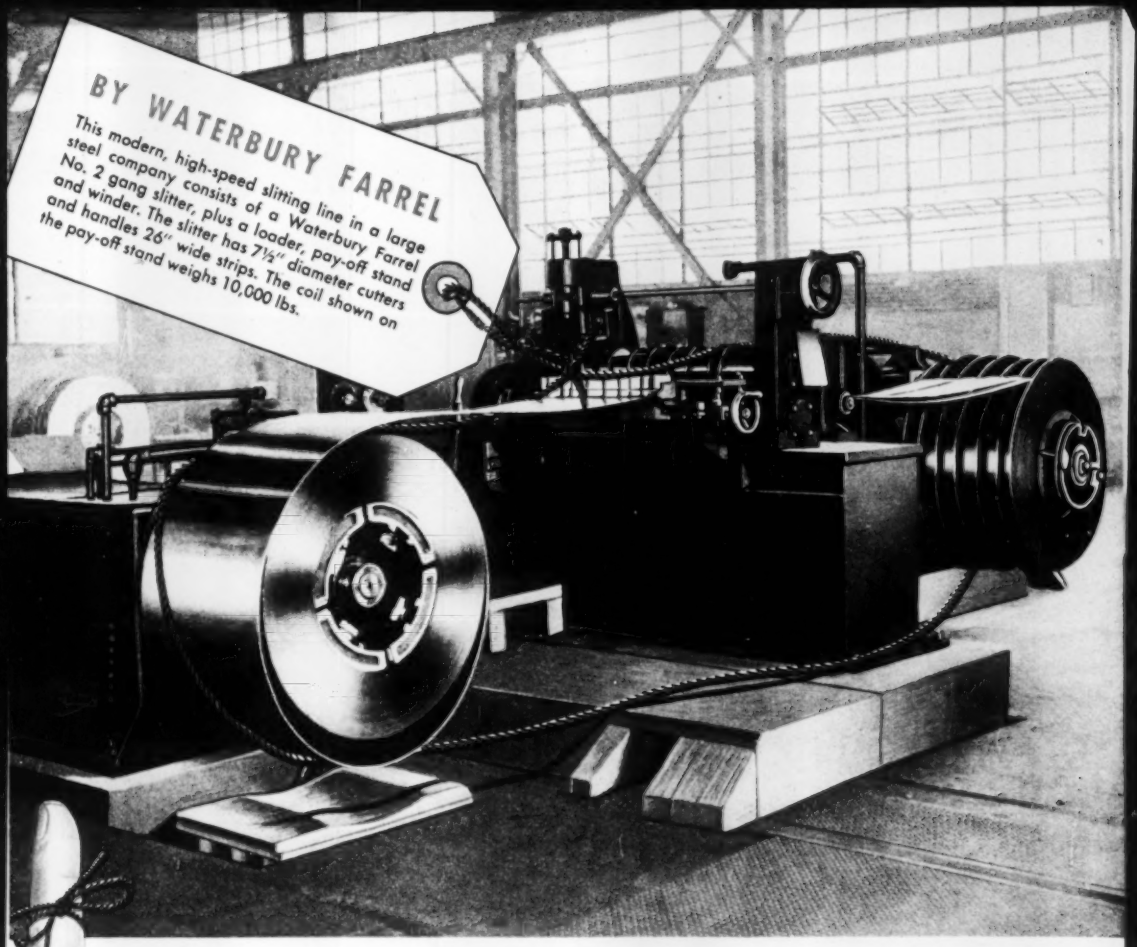
Do your part in the campaign to help meet America's need for more steel. Enlist now for the duration. Remember that the scrap you furnish may help you get more steel.

YOUR SCRAP V YOUNGSTOWN IS NEEDED

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York
MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment.


BY WATERBURY FARREL
This modern, high-speed slitting line in a large steel company consists of a Waterbury Farrel No. 2 gang slitter, plus a loader, pay-off stand and winder. The slitter has 7½" diameter cutters and handles 26" wide strips. The coil shown on the pay-off stand weighs 10,000 lbs.

WHEN YOU NEED A MODERN ANSWER TO SPECIFIC SLITTING REQUIREMENTS

Many manufacturers are finding that slitting their own strip pays in time and dollars.

From Waterbury Farrel you can get modern, high-speed slitting machines fitted by type, size and accessory equipment to your specific requirements.

There are six standard sizes of Waterbury Farrel gang slitters capable of handling a wide range of gauges and widths. Accessory equipment such as loaders, pay-off stands, winders, coilers, backrolls, scrap cutters etc., are available to make the entire slitting set-up a Waterbury-Farrel "package".

Special attachments can be "engineered-in" when necessary to adapt the slitters to special applications.

Phone, write or wire for complete information.

WATERBURY FARREL FOUNDRY & MACHINE COMPANY

WATERBURY, CONNECTICUT, U. S. A. · *Sales Offices:* Chicago, Cleveland and Newark

WF-1

A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY FARREL

LD PROCESS BOLT AND NUT MACHINERY — Headers (all types) • Re-headers • Trimmers • Thread Rolling achines • Slotters • Nut Tappers, etc. POWER PRESSES — Crank • Cam and Toggle; also Rack and Pinion Presses nsfer Presses • Multiple Plunger Presses including Horizontal Drawing Presses and Eyelet Machines; Hydraulic sses, etc. MILL MACHINERY — Rolling Mills • Wire Flattening Mills, Chain Draw Benches • also Slitters aighteners • Pointers • Swagers • Cut-off Saws • Coilers • Winders and related equipment. WIRE MILL UIPMENT — Continuous Fine Wire Drawing Machines • including Upright Cone and Tandem Wire Drawing Machines • Bull Blocks • String-up Machines • Spoolers, etc.

FOUNDED WATERBURY FARREL 1851

In Equipment, Experience Counts. We're 100 in '51!

5 OPERATIONS ELIMINATED

with GROUND and POLISHED STRESSPROOF®

ON ONE COMPRESSOR SHAFT

REPLACED *ALLOY* STEEL!

Originally, this compressor shaft was machined from A4615 alloy steel, then carburized, quenched, cleaned, straightened, and ground twice. When the manufacturer changed to new *Ground and Polished STRESSPROOF* for this part, machining was the only operation required—all other operations were eliminated! The result: faster production and an over-all savings of 59c per shaft.

This case is typical of the dramatic results possible with *Ground and Polished STRESSPROOF*—the finest ground bar steel produced. This bar eliminates many costly manufacturing operations because of its unique combination of four important qualities in-the-bar: strength... wearability... minimum warpage... accurate polished surface. And this sensational steel machines fully 50% faster than heat-treated alloys of the same hardness!

INVESTIGATE, NOW!
Most of today's Ground and Polished STRESSPROOF is going into defense jobs. Occasionally some sizes of bars are available for testing purposes.

La Salle STEEL CO.

1414 150th Street, Hammond, Indiana

Manufacturer of the Most Complete Line of Carbon and Alloy Cold-Finished and Ground and Polished Bars in America

Sheet Mills of about 50 Years Ago

United 6 Stand, 4-High Tandem Hot Mill

50 YEARS AGO

The Old Grey Mare Was Queen of the Highways

DEVELOPMENT of mass production methods in the manufacture of automobiles brought a new era of progress to America. Paved road construction paced new car production . . . farmers were rescued from isolation . . . remote and inaccessible areas were opened for development . . . new industries were born, commerce increased, living standards raised to new, high levels.

Without steel, and the machinery for rolling and forming it, mass production of the automobile and the progress attending it, would have scarcely been possible.

For what United has been able to contribute to better steel rolling processes, we are deeply grateful. It is our hope that we may continue to serve the industry as well in the years to come as we have so earnestly tried to serve it in the past.

Golden Anniversary 1901 UEFCO 1951

UNITED

ENGINEERING AND FOUNDRY COMPANY

Pittsburgh 22, Pennsylvania

Plants at PITTSBURGH • VANDERGRIFT • NEW CASTLE • YOUNGSTOWN • CANTON

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO • LOBDELL UNITED COMPANY, WILMINGTON, DELAWARE • STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

"THERE'S NO MAGIC TO IT--
HE'S EMPHASIZING **READING COPPER TUBING** DEPENDABLE DELIVERY!"

For a dependable source of supply . . . specify Reading brass and copper tubing . . . processed from the basic metal to the finished tubing by one of America's finest completely integrated mills.

READING BRASS COPPER TUBING

READING TUBE CORPORATION

Producers of Reading Lektroneal Copper Tubing and Reading Brass Tubing

OFFICES AND EASTERN DISTRIBUTION DEPOT:
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WORKS: READING, PA.

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• READING, PA. • HOUSTON, TEXAS: 1121 Rothwell St.
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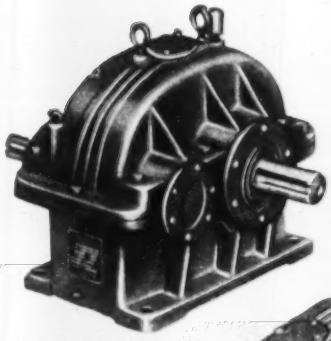
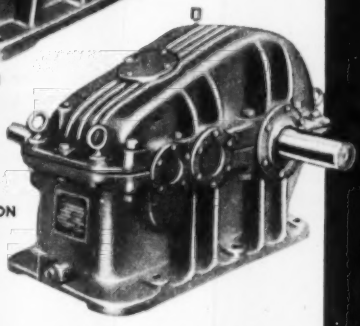


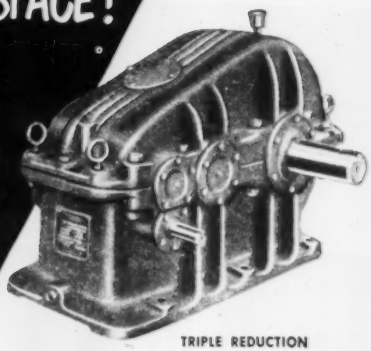
SINGLE REDUCTION



DOUBLE REDUCTION

COMPACT

MORE POWER IN LESS SPACE!



TRIPLE REDUCTION

FOOTE BROS. MAXI-POWER PARALLEL SHAFT HELICAL GEAR DRIVES

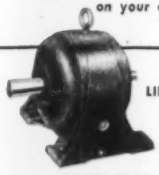
MORE POWER – LESS SPACE – Precision processed gearing, improved materials and heat-treatment, closer manufacturing tolerances, permit selection of smaller size, lower weight units.

IMPROVED PERFORMANCE – Generated helical gearing of maximum accuracy for uniform load distribution—positively located gearing for full tooth engagement across entire gear face—all mean better performance.

SMOOTH OPERATION – Overlapping tooth action of highly accurate helical gearing—close backlash tolerances—reinforced housing design plus extra capacity **Antifriction Bearings Throughout** provide smooth, quiet operation.

42 SIZES – Single, double and triple reductions, ratios from 2.08 up to 360 to 1—capacities up to 1,550 h.p. provide the correct unit for practically any application.

A Foote Bros. enclosed gear drive for any industrial application. Foote Bros. will gladly consult with you on your enclosed gear drive requirements.



LINE-O-POWER DRIVES

HYGRADE DRIVES

FOOTE BROS.-LOUIS ALLIS GEARMOTORS

FOOTE BROS.

Better Power Transmission Through Better Gears

WRITE FOR BULLETIN MPB

FOOTE BROS. GEAR AND MACHINE CORPORATION
Dept. X, 4545 So. Western Blvd., Chicago 9, Ill.

Send me Bulletin MPB on Foote Bros. Maxi-Power Drives.

Name.....

Company.....

Position.....

Company Address.....

City..... *Zone*..... *State*.....

MORS

END MILLS

are experts at Curling, too!

If you want to put the canny Scotch touch on your end-milling costs . . . *then specify Morse Hi-Helix!*

For this is the only design of end-mill that gives you real Morse shear-cutting performance . . . *making the chips CURL and roll out without clogging the flutes.* Cutting action is fast and smooth. Tool-life is far longer. And for even greater tool life, specify Morse Electrolized.

What's more, Morse *Hi-Helix* End Mills are properly undercut and ground with a primary and secondary clearance. And because Morse puts more into their manufacture, you get more out of Morse End Mills in production . . . which makes it just as simple as this: *If you want Morse Quality, then be sure you get genuine Morse Tools.* Ask your Morse-Franchised Distributor . . . he has the stock and the experience to make sure you get exactly what you need.

MORSE TWIST DRILL & MACHINE COMPANY
NEW BEDFORD, MASS.
(Div. of VAN NORMAN CO.)

Warehouses in New York, Chicago, Houston, Detroit, San Francisco

MORSE
Cutting Tools

Let's go...let's get that SCRAP in!

All your SCRAP is urgently needed, NOW

THE scrap shortage is serious. *Your* scrap—every pound of iron and steel scrap you can locate in your plant or factory—is vitally needed and needed right away. For unless you do everything possible to get this scrap on its way to the mills, steel production is bound to slow up. That can't be allowed to happen. But without your help it surely will.

It takes at least one-half ton of scrap to make one ton of steel. With the mills turning out more than 2 million tons of steel per week, over 1400 carloads of industrial scrap are needed *every day*. And industry, somehow, must provide it.

What you can do to meet this emergency

First, organize a permanent Scrap Salvage Committee and make the "drive-for-scrap" part of your daily operations. Search out every possible source of scrap. Turn your old and worn-out equipment, tools and machinery over to your scrap dealer, at once. Dig out your discarded dies, rusted-out tanks and boilers, your old rails and other miscellaneous junk, and start them back to the mills through your scrap dealer. Encourage every employee to report every retired or obsolete machine that now stands idle—see that it is turned in for scrap.

By getting this "dormant" scrap off your premises and into the furnaces you'll be helping not only yourself but America as well. *More* scrap turned in, means *more* steel turned out—it's as simple as that. So let's get going.

You'll find your local scrap dealers listed in the yellow pages of the phone directory.

USS

1-1328

This page would ordinarily be used to tell you about

AMERICAN MANUFACTURERS WIRE

but, because without SCRAP we cannot produce steel, we are asking instead for your all-out help in getting more SCRAP to the mills.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

NEW

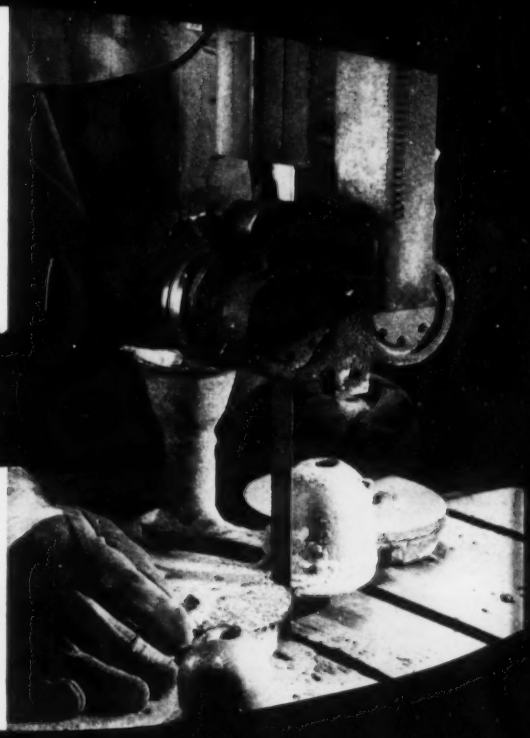
DoALL FRICTION SAW BANDS

Now Available!

DoALL *Friction Saw*
Actual Size 1" Wide 10 Pitch

for all High Speed Band sawing machines 3,000 to 15,000 blade feet per minute

A Better, Longer-life Blade
Actual Size ½" Wide 14 Pitch



Special heat treating process locks the teeth against ripping out
Actual Size ¾" Wide 10 Pitch

A Saw Band for Every Job
AVAILABLE FROM STOCK

DoALL makes the world's most complete line of saw bands for cutting every material. All are packaged in the exclusive DoALL "strip-out" container for safety, convenience and blade protection. These bands are AVAILABLE FROM LOCAL DoALL STORES. Call DoALL today.

The Fastest, Cheapest way to cut Ferrous Metal Shapes

HIGH speed friction sawing generates enough heat to soften the metal ahead of the blade — makes possible shape cutting and cut-off work not practical with any other machining method. It cuts many times faster than conventional methods. Use it for cutting thicknesses up to 1". Cut cast irons and carbon, manganese, nickel, chromium, molybdenum, stainless steels and others. Cut a shape from armor plate or cut the gate or riser off a casting.

New DoALL friction saw bands have the teeth locked in by a special heat treating process so that you get longer blade life and lower costs. They are available in ½", ¾" and 1" widths; 10 or 14 pitch; 500 ft. lengths or cut lengths welded to fit your machine. For the ultimate in friction sawing use DoALL saw bands on the DoALL Zephyr Band Machine. Ask for a *free demonstration* at your plant.

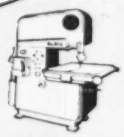
THE DoALL COMPANY, 254 N. Laurel Ave., Des Plaines, Ill.

SB-1

ASK FOR DoALL BAND TOOL MANUAL

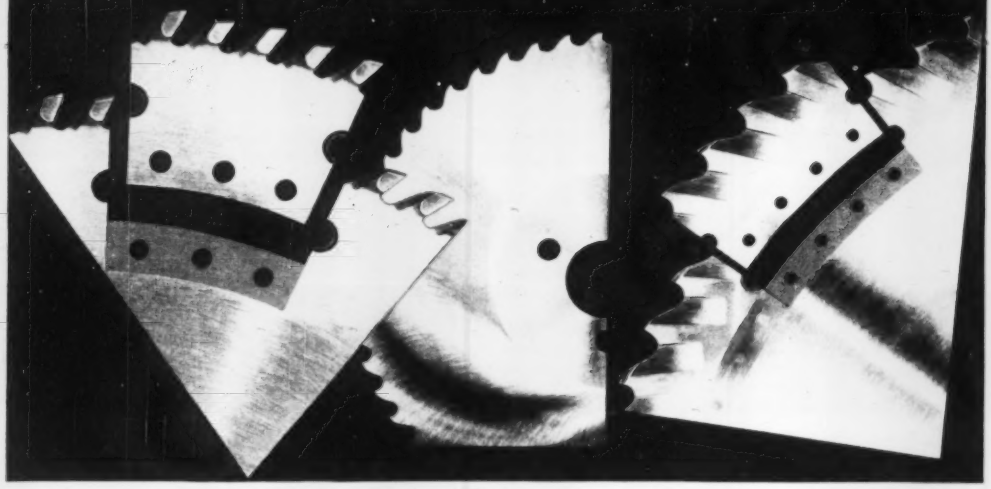
DoALL

SALES-SERVICE STORES IN PRINCIPAL CITIES



Machine Tools . . . Gaging Equipment . . . Tool Steel . . . Band Tools . . . Metal Working Supplies

FOR EVERY METAL-CUTTING JOB



ATKINS "Silver Steel" DURATIP (Carbide Tipped)

A new segmental type circular saw that already has proved outstandingly superior for speedy cutting of non-ferrous metals. Easily cuts 2" aluminum at power feed of 17 feet per minute at 3600 R.P.M. The 14" Diameter blade runs cool and true, without expansion damage. (Materials to be cut, RPM, type of machine, etc., should be given when ordering this type of saw.)

ATKINS
High Speed Steel MILLING and SLITTING SAWS

For cleaner, truer cuts; for fast, free feeding; for reduced danger of tooth breakage, this solid tooth saw with self-cleaning teeth is the ultimate in efficiency! It cuts ferrous and non-ferrous metals with minimum horse power per cubic inch of metal removed—*at the lowest possible tool cost per cut!*

ATKINS Curled-Chip SEGMENTAL

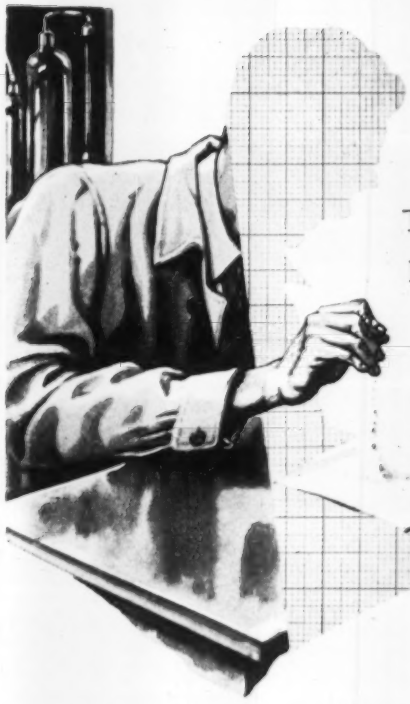
Shock-proof, high speed steel—for billet sawing, ingot cropping, bar cut off, gear blanks . . . steel, cast iron, copper, alloys, bronze, aluminum, brass. Has the Atktins-proved, scientific tooth form which reduces horsepower required and *cuts cutting costs!*

E. C. ATKINS AND COMPANY

Home Office and Factory: 402 S. Illinois St., Indianapolis 9, Indiana *Branch Factory:* Portland, Oregon
Knife Factory: Lancaster, New York *Sales Offices:* Chicago • Portland • New York

AAA TRADE MARK ATKINS "ATKINS ALWAYS AHEAD"

ATKINS



This 'dust' man is worth his weight in gold–to you

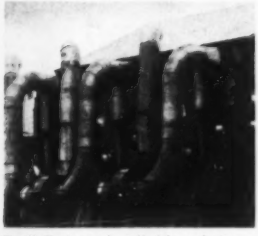
He's the man behind the most efficient, most economical method of collecting nuisance dust.

There are still many industrial men who have yet to sit across the desk from an industrial dust engineer–a man who may be actually worth his weight in gold to you.

If you are one of these men, you have a revealing half-hour in store–a half-hour that can show you the most efficient, low-cost way to eliminate the escape of objectionable nuisance dust…to raise employee morale…to boost plant-community relations.

The reason? Buell's staff of industrial 'dust' men draw on more than 200 man-years of experience in the design and construction of high-efficiency, trouble-free Dust Collection Systems. You will learn of the success of hundreds of Buell Installations. You will learn how one can be designed for you.

For full information about Buell Dust Collection and Dust Recovery Systems, write today. Ask for the new illustrated Buell 'Dust Collection' bulletin. It can be a highly profitable move. Buell Engineering Company, Dept. 26-K, 70 Pine Street, New York 5, N. Y.



Buell Cyclones installed in series to collect nuisance dust at a steel plant. High efficiency operation is assured by exclusive 'Shave-off' feature.

ELECTRIC CYCLONIC

buell

HIGH EFFICIENCY CYCLONES • ELECTRIC PRECIPITATORS
TYPE 'LR' COLLECTORS • LOW DRAFT LOSS COLLECTORS
SPECIAL PURPOSE COLLECTORS • DUST HOPPER VALVES

ENGINEERED EFFICIENCY IN DUST COLLECTION

ONCE AGAIN the nation's steel production depends on you!

Scrap

FOR THE SAKE OF AMERICA!

Scrap iron and steel are vital to the production of steel . . . and America's mills are turning out over 100 million tons of ingot steel annually. That takes a *lot* of *scrap!*

Yet lack of scrap may cause steel production to *sag* . . . right when our nation needs more steel than ever. And there's only one way to meet the need: Get in *all* the scrap that you can, *now*.

You can help now . . . this way

Check your plant or factory—check the grounds, too. Gather up all the scrap steel—old or obsolete machinery and equipment, rusting tanks and boilers, rails and sheets. Your local scrap dealer will pay you today's good prices and start this vitally needed material on its way.

Production is the key to solution of many national problems . . . and production requires steel. Help keep production high by getting in the scrap!

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

OF COLD ROLL FORMING

● Knowing just when, where, and how to resort to cold roll forming may have far reaching effects on sales volume, costs and profits in your business.

Often, when production of a new part or product is being planned, the demand is too small or uncertain to warrant the adoption of cold roll forming; and by the time this condition has changed, making cold roll forming profitable, no one gives the subject a second thought.

One operator and a helper with a Yoder Cold Roll Forming machine will produce upwards of 20,000 or 30,000 feet per day of mouldings; structurals; siding, roofing, cabinet shell and panel sections; tubular and other shapes. Conversion cost is so low that a machine may be profitable operating only a few days per month. Other advantages are often reduced weight, with big savings in material cost; greater accuracy and uniformity; fine finish.

Welding, coiling, ring forming, notching, perforating, cutting-to-length and other operations can be incorporated in a cold roll forming production line, with little or no added labor cost. These and other subjects are discussed in the new Yoder 88-page Book on the economics as well as mechanics of Cold Roll Forming. Write for free copy. Recommendations and estimates for the asking.

THE YODER COMPANY • 5502 Walworth Ave., Cleveland 2, Ohio

Complete Production Lines

- ★ **COLD-ROLL-FORMING and auxiliary machinery**
- ★ **GANG SLITTING LINES for Coils and Sheets**
- ★ **PIPE and TUBE MILLS–cold forming and welding**

ENGINEERING YODER MANUFACTURING

VITAL STRUCTURE

in Barium's chain of steel service to industry

Making structural shapes is a vital activity in a chain of companies that form a single complete source of steel supply.

The companies are Barium subsidiaries. The maker of structural shapes is Barium's Phoenix Iron & Steel Company, also producing angles, beams, channels, and, through their subsidiary, Phoenix Bridge Company, constructing and engineering bridges, buildings, and other fabrications from structural steel and plate.

Phoenix is one of fifteen strategically located Barium subsidiaries controlling quality from blast furnace to end product, ready to work closely together (as a self-contained unit, if need be) to solve your steel problems.

Call on Barium without obligation for unbiased advice, whatever your steel need . . . plate, structurals, fabrications, forgings, stampings, springs, bolts, nuts. Contact Barium at 25 Broad Street, New York City.

BAYONNE BOLT CORP. • CENTRAL IRON AND STEEL CO. CHESTER BLAST FURNACE • CLYDE IRON WORKS, INC. CUYAHOGA SPRING CO. • ERIE BOLT AND NUT CO. GEOMETRIC STAMPING CO. • GLOBE FORGE, INC. INDUSTRIAL FORGE AND STEEL, INC. • JACOBS AIRCRAFT ENGINE CORPORATION • KERMATH MFG. CO. • KERMATH LIMITED (CANADA) • PHOENIX BRIDGE CO. • PHOENIX IRON AND STEEL CO. • WILEY MANUFACTURING CO.

BIGGEST BARGAIN AVAILABLE in a BAND-TOOLED MACHINE

ONLY $750.00 For the "UTILITY" DoALL

DOUBLE RANGE • VARIABLE SPEED • 16" COMBINATION
Band Sawing, Filing and Polishing Machine with Welder—Priced Lower Than Anything Comparable

SMALL shops, large shops, don't pass this up. Here is $750.00 worth of versatile band machine that does full scale, precision band sawing and filing for the majority of small shop jobs or experimental and model work for large shops. The DoALL Utility band machine gives you a full 16" throat with *variable speed in two ranges* from 50 to 350 and 860 to 5200 F.P.M. The machine pays for itself in short order because its wide range of application lets you save valuable manhours — frees larger machines for heavier more profitable work.

The versatile DoALL Utility model cuts any shape faster and cleaner. Cut or make dies, punches, stampings, templates, various machine parts, models, tools, jigs or fixtures quickly and easily.

For external or internal filing it takes only a moment to change over the Utility. Filing on a DoALL is 9 times faster than hand filing, 4 times faster than by jig.

DoALL also offers you the greatest selection of saw bands and band files for any job, any band machine. They are readily available for immediate delivery from local stock.

See the DoALL Utility band machine operate in your plant. Ask for a FREE DEMONSTRATION. Call your local DoALL store or write :

THE DoALL COMPANY
254 N. Laurel Ave., Des Plaines, Ill.

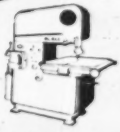
NEW, LONGER-LIVED DoALL SAW BANDS AVAILABLE FROM LOCAL STOCK!

Increased production makes all sizes, all types of DoALL Saw Bands available for immediate delivery from local stock. All are packaged in the exclusive DoALL "strip out" container for safety, convenience and blade protection. There is a DoALL Saw Band for every job.

Send for Free Bulletin

Learn about jobs that DoALL Band Machining can do for you. Find out how to cut any shape, any material faster, better, more economically.

B-5



INDUSTRY'S NEW TOOLS **DoALL** 33 SALES-SERVICE STORES

Machine Tools . . . Gaging Equipment . . . Tool Steel . . . Band Tools . . . Metal Working Supplies

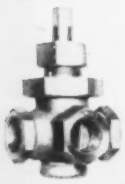
WE MAKE ALL TYPES OF PLUG VALVES

For *ALL* Kinds of Services
In the Right Metals for Your Needs

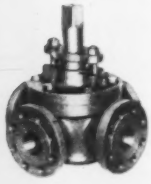
HOMESTEAD
Lever-Seald
Quarter-Turn
PLUG VALVE

HOMESTEAD CAM-SEALD
(dry seat)

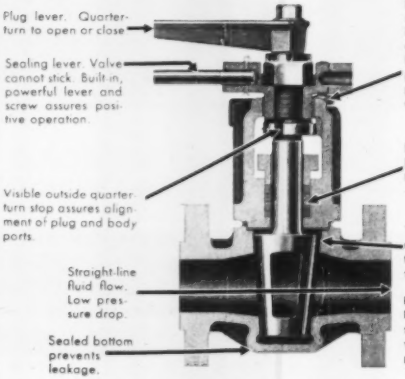
Straight-way—
Flanged or Screw Ends



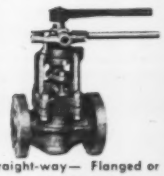
Three-way—
Screw or Flanged Ends



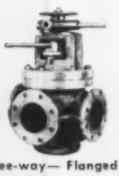
Four-way—
Flanged or Screw Ends


Plug lever. Quarter-turn to open or close.
Sealing lever. Valve cannot stick. Built-in, powerful lever and screw assures positive operation.
Visible outside quarter-turn stop assures alignment of plug and body ports.
Straight-line fluid flow. Low pressure drop.
Sealed bottom prevents leakage.
Positive stop allows seating pressure to be relieved only enough to overcome friction between plug and body and permit easy turning of the plug.
Deep stuffing box and gland. No leakage.
"Lever-seald" action presses mated metal surfaces firmly together to form perfect seal against leakage.
Protected seating surfaces. No fluid or grit passes across seating surfaces. Maximum valve life and lowest cost-per-year service.

Sectional View — Homestead Lever-Seald Valve — Closed Position



Straight-way— Flanged or Screw Ends



Three-way— Flanged or Screw Ends

Four-way— Flanged or Screw Ends

HOMESTEAD-REISER
(lubricated)

Straight-way—
Screw or Flanged Ends

Straight-way—
Worm & Gear Operated

Flow Changer—
Non-lubricated

You can end valve-operating difficulties on high temperature, pressure and corrosive services, and on jobs where lubricant would contaminate process fluids, by installing Homestead Lever-Seald Valves. They are stick-proof, because a *built-in* lever and screw device assures positive action at all times, under all conditions. If the service warrants, they may be double-sealed by pressure gun lubrication.

Homestead Lever-Seald Valves are available in straight-way, three-way, and four-way types, with screwed or flanged connections. They may be cast in Semi-Steel, Steel, Ni-Resist, Stainless Steel, Monel, or other alloys; in sizes from 1" to 10"; for vacuum to 1500 lbs., and for temperatures from 40° below zero to 1100°F. For full information, write for Valve Reference Book No. 39-3. No obligation.

Distributors in all parts of the world. For local representative see Classified Telephone Directory.

HOMESTEAD VALVE MANUFACTURING COMPANY
P. O. BOX 22 *"Serving Since 1892"* **CORAOPOLIS, PA.**

ELECTRUNITE TUBING

Eases Life-

FOR THE MANUFACTURER...

FOR THE PATIENT...

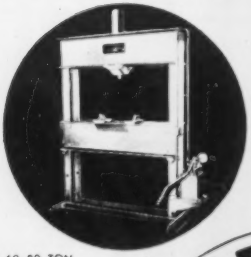
HOSPITAL PATIENTS can relax in every position, from full-reclining to upright, in this sturdy rejuvenating chair made by Barcalo Manufacturing Company. Steel tubing provides the stiffness and rigidity to make the chair steady and reassuring to the patient, yet light to move.

The manufacturer likes the way ELECTRUNITE Steel Tubing works on this application. Uniform ductility and wall thickness assure rapid, predictable forming and bending of the tubes to shape. Where tube ends must be fully flattened at joints, there's no trouble with cracks and fractures. The excellent surface of this ELECTRUNITE Tubing requires no special handling or trick treatments to hold long-lasting finishes under severe service.

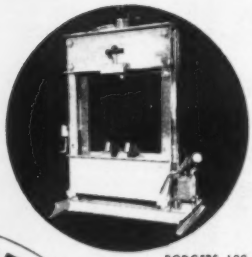
Have you considered using ELECTRUNITE Steel Tubing in your essential products, such as these invalid chairs? We'll be glad to discuss your problems . . . and offer you the benefits of Republic's 3-Dimension Metallurgical Service. It's the helpful service that focuses the knowledge and experience of field, mill, and laboratory metallurgists on your fabrication problems.

REPUBLIC STEEL CORPORATION
STEEL & TUBES DIVISION
224 EAST 131st STREET
CLEVELAND 8, OHIO

Republic
REPUBLIC STEEL
ELECTRUNITE TUBING

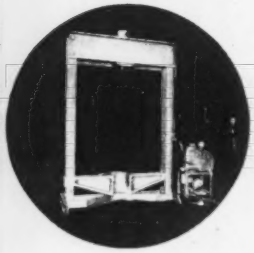


RODGERS 60–80 TON
SHOP PRESS

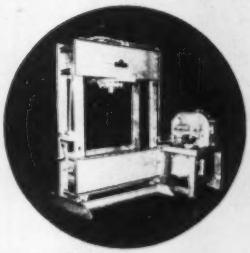


RODGERS 100 TON
SHOP PRESS

HYDRAULICS
Rodgers
KEEP THE WORLD MOVING

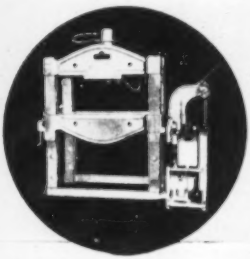


RODGERS SPECIAL
SHOP PRESS



RODGERS 150–200 TON
SHOP PRESS

RODGERS SPECIAL
100 TON
SHOP PRESS



RODGERS 300 TON
SHOP PRESS

FOR 101 UNUSUAL JOBS THERE'S NOTHING LIKE A

RODGERS SHOP PRESS

YES, a Rodgers Hydraulic Shop Press is about the handiest piece of equipment you can find for those many pressing, forming, bending and straightening jobs, for die tryout, short production runs and scores of other uses. They are versatile, time-and-labor-saving presses with construction and operating features that make them adaptable to all requirements . . . Standard model presses are available in 60, 80, 100, 150, 200, 300 and 400 ton capacities with hand or power pumps—special or modified units will be supplied to specifications.

Send for Catalog

Rodgers Catalog No. 31A has descriptions and specifications on the complete line of Shop Presses.

HYDRAULICS Rodgers KEEP THE WORLD MOVING

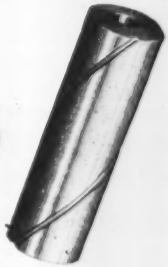
Rodgers Hydraulic, Inc.

7423 Walker St., St. Louis Park, Minneapolis 16, Minn.

HYDRAULIC POWER EQUIPMENT

MUELLER BRASS CO.

600 series a better bearing bronze containing no hard-to-get tin

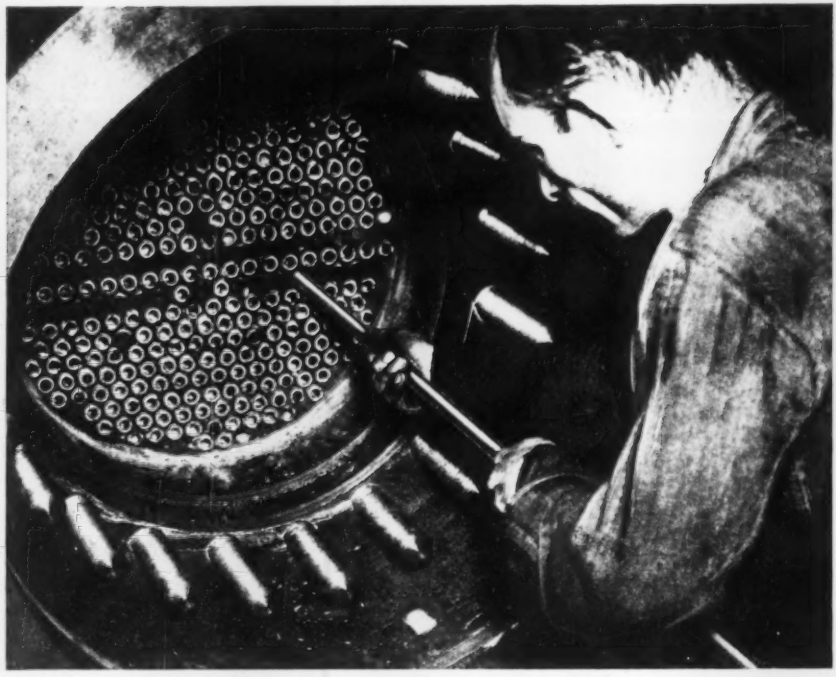


Four typical parts forged from Mueller Brass Co. "600" series Bearing Bronze.

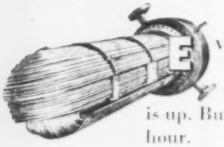
If you use gears, connecting rods or other parts of bearing metal in your products, it will pay you to investigate Mueller Brass Co. "600" series, a forgeable bronze that *contains no critical tin.* This bearing metal outperforms phosphor bronze and other bearing metals and will save you money in your applications. "600" series bearing metal can be forged into relatively complicated shapes and produces a forging of close-grained homogeneous structure impossible to get in a casting. The forged shape is closer to finished size than a casting and requires less machining. "600" series alloys have a low coefficient of friction, a tensile strength 2½ times greater than cast phosphor bronzes and a high resistance to corrosion. "600" has a 25 year record of outstanding performance on some of the toughest bearing applications. There is a "600" series alloy with the properties to fit your bearing metal needs . . . write today for further facts.

MUELLER BRASS CO.

PORT HURON 19, MICHIGAN 54



One of the "Four Hundred"



EVERYTHING's going up. Everything, that is, except the cost of *power*. Fuel is up. Labor is up. Equipment cost is up. But not the cost per delivered kilowatt-hour.

Power plant engineers let you in on the secret: "It's a principle," they say, "*the higher you raise steam temperature and pressure, the more power you get per pound of fuel.*"

But there's an added factor in this seemingly simple formula. For already, boiler pressure-temperatures have been pushed up until the steam lines glow red; and that calls for supplying feedwater under conditions that are something special. Look, for example, at the heater pictured here.

It contains more than 400 metal tubes, totalling 5 miles in length. Every minute, the heater rams 1090 gallons of 450 F. water into the thirsty maw of the main boiler at a pressure of 3,200 pounds per square inch.

So there, Mr. Designer, is your problem. To find a material to make those thin-wall tubes with the strength to stand such temperatures and pressures . . . plus a few extras for good measure:

Tubes must be elastic, to shrink and swell in tune to the steel tube sheets; possessed of high heat transfer properties, an extremely low corrosion rate, erosion-resistant, and easy to weld.

The designers who faced those eight "musts" found their answer in one metal: Monel, one of the family of INCO Nickel Alloys.

What of the Metal Problem facing You?

Could one or another of the Inco Nickel Alloys help you solve it? Very possibly. Write us about it. Under present conditions, so much Nickel is needed for defense work that we have to stretch our production to cover the most essential needs for INCO NICKEL ALLOYS. But we are ready right now to help you with ideas and suggestions for your present production and future planning.

The International Nickel Company, Inc.
67 Wall Street, New York 5, N. Y.

Nickel INCO **Alloys**

November 19, 1951

Chairs Empty in Washington?

Important men in the defense production program in Washington, most of them on loan from industry, will resign in the next three or four months. Reason: They want no part of the presidential election campaign in 1952. They have to quit early enough to avoid any overt charge of political desertion by the Democrats and to avoid being publicly bracketed with President Truman. The whole situation indicates the troubles the government has in getting competent men.

Efficiency and CMP

Defense Mobilizer Charles E. Wilson says CMP is operating "at between 90 and 95 per cent efficiency in only the second quarter of its operation." He admits that it will never operate at 100 per cent effectiveness, but predicts that efficiency will improve in coming months. Significance: Officials in the defense production program must cope with the rising demands for decontrols. The steel industry is building up a case for the end of distribution curbs, and the steel castings industry has just asked NPA to remove its product from CMP.

Help on Materials

Despite the efficiency claimed for CMP, many of you are still unable to place your first-quarter CMP allotments. Probably before the end of this week questionnaires relating to that situation will be available in NPA division and field offices and at claimant agency headquarters. If you can't get first-quarter tickets honored, fill in the form and send it to the official named therein. He has the duty to review your case.

A Jingle in Its Jeans

Defense spending will reach new highs in fiscal 1952. New obligational authority for the federal government approved by Congress to date for fiscal 1952 totals $89.6 billion, compared with $83.8 billion for all of fiscal 1951 and $50.2 billion for fiscal 1950. The 1952 figure is bound to be higher because Congress can be expected to approve more supplemental requests when it reconvenes Jan. 8. The Defense Department has the largest chunk for 1952—$59.4 billion. The Mutual Security Program has the second largest—$7.3 billion.

Cold Comfort in Copper

RFC's $57 million loan to Copper Range Co., Boston, is one step to help relieve the near-desperate copper shortage, but the hard fact remains that the U. S. does not have enough domestic copper and can't import sufficient to make up the deficit. Copper Range will use the money to develop a copper vein in upper Michigan. Ultimately 10,500 tons of ore will be produced each day.

More Tools Demothballed

If you have Army or Air Force primes or subs, but need tools, get in touch with your contracting officer. About 10,000 machine tools,

Production-Engineering News—p. 87 The Market Outlook—p. 163

last of a 47,000 mothball stock held by the Navy, will be made available to Army and Air Force contractors. Since the Korean war started, the Navy has shipped 15,000 tools to defense contractors, turned over 5000 to the Army and Air Force for distribution to their contracts and shipped another 16,000 to contractors working on joint contracts of the Navy Bureau of Aeronautics and the Air Force.

The British Save Metals

British manufacturers are building jet engines with a shorter life span than is common in the U.S. The English believe that engines built for wartime use need not be engineered to last as long as the same engines in peacetime. They make the engines just as powerful as U.S. products but they use smaller quantities of scarce materials.

Wet Blanket on Expansion

The new corporate tax structure is already putting a wet blanket on business expansion. Bulk of the projects announced in the last 18 months were being financed out of profits, but today that method of financing is discouraged now that industry must hand over 70 cents in cash out of every earned dollar to the government. High taxes also discourage the sale of stock issues, so that method of raising equity capital becomes increasingly difficult.

Straws in the Wind

Federal Reserve Board's industrial production index reached an estimated 220 in October, the highest since last June . . . Starting in January, the Bureau of Labor Statistics will issue a new weekly wholesale price index using 1947-1949 as a base instead of 1926 . . . Some $90,000 worth of equipment will be provided for each production worker at U.S. Steel Corp.'s new Fairless works . . . Bethlehem Steel Co.'s blast furnace "H" at Sparrows Point, Md., produced 56,010 tons of pig iron in October for a new world record . . . The U.S. will earmark an additional quantity of steel to Great Britain in the first quarter of 1952 in exchange for scarce materials that may include tin, rubber, copper, lead, zinc or aluminum.

What Industry Is Doing

Labor demands, higher overhead and materials costs and inflationary aspects of higher taxes all contribute to the onslaught on industrial prices (p. 59) . . . A new kind of scrap drive is tried in Racine, Wis. (p. 61) . . . More steel—9,096,000 tons—was made in the U.S. in October than in any month in history (p. 62) . . . Vending machines have a place in defense (p. 63) . . . Metal stampers are caught in the middle in our dual economy (p. 63) . . . West Europe boosts defense spending (p. 69) . . . Subcontractors will produce a third of the $1.5 billion annual machine tool production rate by next July (p. 70).

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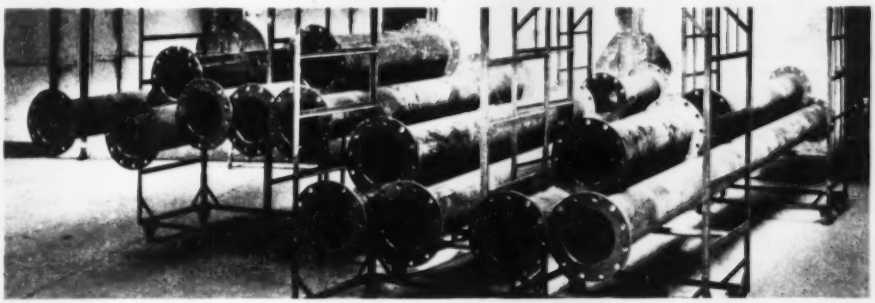

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True Leadership

A disconcerting aspect of the current public mood is its almost complete resignation to the idea that another wave of inflation is inevitable. You have to look far and long before you will find anybody of commanding influence who will come out strongly and clearly in opposition to pending follies which will give fresh impetus to inflationary forces.

It is no secret that labor union chieftains have decided to seek wage increases and fringe benefits that will break the present government formulas. It is taken for granted that government agencies and employers will resist extravagant demands vigorously, that these demands will be trimmed substantially and that in the end the unions will be granted increases that will break through government ceilings.

Whether or not these steps can be taken without disastrous strikes remains to be seen. At any rate, the increased wages will necessitate price increases for steel. Because steel is basic, higher steel prices will necessitate higher prices for thousands of manufactured products. Inflation will have gained new momentum.

If it were possible to isolate this new upsurge of inflation from other factors, controlling it might not be too difficult. Unfortunately it cannot be thus segregated. It must be attacked as a component part of a conglomeration of many disturbing factors affecting our national destiny. Among them are the administration's belief that present emergency conditions will prevail for a decade or more, continued heavy expenditures for defense accompanied by wasteful expenditures for nonessentials, a tax burden far too heavy for the nation's safety and the certainty that the administration will insist that more controls, retained over a prolonged period, will be necessary to combat the new perils.

This alarming outlook stems from incompetent government administration. The President and many members of Congress have overplayed petty politics. They think giving the people "something for nothing" is the way to win votes.

The time is ripe for true leaders who will not seek popularity by appeasing every pressure group but who will command respect by doing the right thing whether or not it is popular.

E. L. Shaner

EDITOR-IN-CHIEF

A LOGICAL EXPEDIENT: American machine tool builders have orders totaling $1.3 billion, which is about 23 months of production at current rate of shipments. Orders for an additional $1.5 billion will be placed between now and next July. Annual rate of production at the end of 1951 will be over $600 million. The present target is to be producing at an annual rate of $1.5 billion by mid-year 1952.

How? The logical way is to resort to subcon-

tracting on a grand scale. It avoids construction of new plants, utilizes skilled labor where it exists, does not disrupt existing management and engineering teams and protects the machine tool industry from fantastic over-capacity. One weakness is that it is expensive. Subcontracted work will cost more. The increased costs will be reflected in selling prices. At the same time, this higher cost of production in subcontractors' shops is assurance to the machine tool builders that emergency subcontractors will not be competitors when things return to normal.

This subcontracting expedient looks good on paper. Let's recheck it next July and see how it has worked. —p. 70

* * *

IMPORTANT JOBS AHEAD: Demand for structural steel for the first quarter of 1952 is more than 200 per cent of the estimated supply of 1,425,000 tons. As a result, the requests of claimant agencies have had to be cut back on an average of 50 per cent of stated requirements. This means that in many instances the reduction is more than 50 per cent.

These apparently necessary reductions in allocations will cause deferment of numerous important projects. Among these are schools and highways, which already are dangerously inadequate and are becoming more so every day. The longer the more essential school and road building projects are postponed, the greater will be the task of making up for lost time later.

When conditions permit, the school and highway problems must be given special attention. The death rate attributable to inadequate roadway facilities is a national disgrace. —p. 65

* * *

HURT MORE THAN HELP: Steelmakers in the United States produced more steel in October than in any previous month. Total output for ingots and castings was 9,096,000 net tons. This is the third month in which production has topped 9 million tons.

Out in San Francisco at the fourth annual regional conference of the American Iron & Steel Institute, President Walter S. Tower said that steel tonnage required for direct defense production is about a million tons a month. "Industry," he said, "can turn out a year's supply for that purpose in two months." Perhaps this was willful understatement. At the October rate, the direct defense requirements could be supplied in one and one-third months.

The important point in Mr. Tower's discussion is that the low percentage of defense requirements for steel does not warrant existing cumbersome controls. They hinder more than they help. —p. 62

* * *

AUTOMATS IN DEFENSE: Question of what is essential and what is not essential in our preparedness program was re-emphasized at last week's fifth annual conference of the National Automatic Merchandising Association in Cleveland. If one thinks of vending machines as dispensers of nonessential merchandise, then they do not rate priorities for scarce materials. On the other hand, if you can prove that the machines actually release substantial numbers of salespeople for other tasks, you can build a case for reasonable allotments of materials for vending devices.

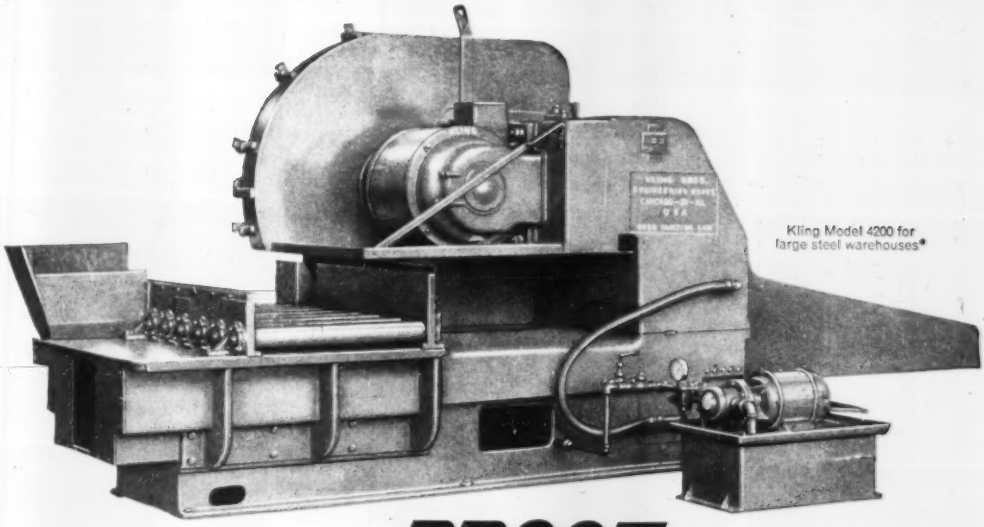
Impressive is the fact that as of September, 1951, of the 2,352,483 vending machines in use, 1,133,594 were in defense plants and 144,529 were in military posts. In addition to this, vending machine manufacturers are gradually shifting over into defense work—some to the extent of 50 per cent or more of capacity. —p. 63

* * *

DURABLE NAMEPLATES: In 1946 Boeing Airplane Co. set out to find a better type of decal for use on Boeing Stratocruisers. Its research engineers were asked to develop something that would adhere firmly to various surfaces, would remain legible after long use and would resist abrasion better than the conventional paper decals then in use.

Result of this search are paper-thin aluminum appliques which are being produced by the millions for use not only on aircraft and aircraft parts but on hundreds of other articles such as golf clubs, radio sets, refrigerators, electrical equipment, etc. In fact, they are used on almost anything that requires a durable name plate, label or instruction sign.

Boeing makes these plates, trademarked Metal-Cals, for use on its own products and has licensed C & H Supply Co., Seattle, to manufacture them for other users. —p. 104



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8"x8"x3 4" Angle	11 seconds
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4" Round	15 seconds
6" O.D. Tube, 1 2" Wall	11 seconds

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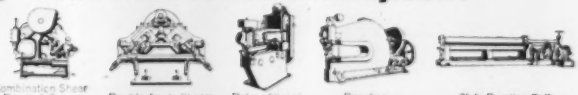

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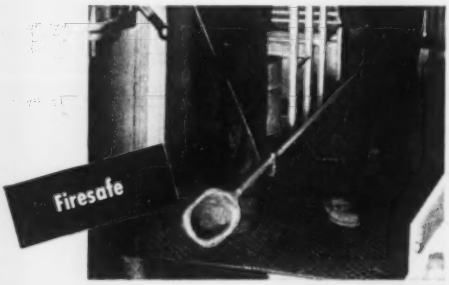

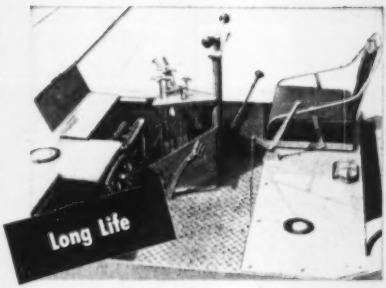

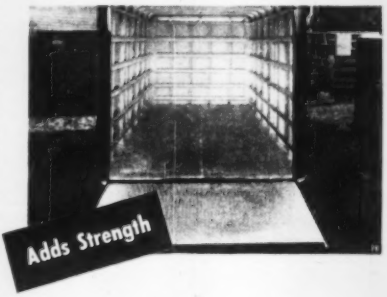

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Pressure on Prices Mounts

Labor demands, higher overhead and materials costs and inflationary aspects of higher taxes all contribute to the onslaught on industrial prices

THE BEGINNINGS of an early spring price flood are appearing now, and labor is doing nothing to help with the dikes.

The pictogram shows commodity prices in the past few weeks may have started an upswing ominously like a wave that began just a year ago and reached its crest in the week ended last Mar. 27 when commodity prices—including those for fuels, building materials, chemicals and metal products which are of greatest concern to metalworking—rose to 183.9 per cent of the 1926 average.

Head Start—The dangerous aspect of the latest rise is that it starts 4.2 per cent above where it began last year. The all-commodities index for the week ended Nov. 6, 1951, was 177.2, compared with 170.0 in the corresponding week a year earlier. If the 1951-52 price wave in all commodities follows closely the 1950-51 cycle, brace yourself for the index to rise to 190 or slightly higher by next March, then to fall off gradually to current levels by next August or September.

Many factors will contribute higher prices in coming months, but one of the most important will be expected widespread increases in wages. Last week the United Steelworkers of America-CIO held meetings in Atlantic City, N. J., to formulate demands for higher pay scales that will be presented to the steel industry, probably late this month. The USA is spearheading organized labor's drive for higher wages, which in turn will bring higher prices. The CIO at its New York convention served notice on Washington planners that it will try to crack the wage freeze.

More Pressure—Rising materials and overhead costs will be another factor forcing prices upward. Many of those cost increases can be reflected in the price setup now that the Capehart Amendment is at last in effect. It was passed more than three months ago as an amendment to the Defense Production Act and allows manufacturers to take into account many increases in overhead, materials and labor costs between Jan. 25 and July 26, 1951. (See the following story for greater detail about the Capehart Amendment).

Still another factor contributing to the inflationary psychology—although not directly to higher prices—is the higher corporate income tax. The Administration argued for the higher tax on the grounds that it was deflationary. It is deflationary in that it siphons off private buying power, but it's decidedly inflationary in that it tends to make companies less exacting about overhead expenses because they can write much of them off against taxes.

Serious Problem—In a STEEL survey on that subject, nearly all companies contacted were alarmed about that aspect. It wouldn't be too serious if the sky-high levies were only temporary, but the majority of firms echoed the sentiment of Russell Steffy, comptroller for Ft. Pitt Bridge Works, Pittsburgh. He says: "I believe corporate taxes will continue to be high for an indefinite period."

Even higher corporate income taxes may come fairly soon. Budget Director Frederick J. Lawton last week dropped the third in a series of Administration hints that President Truman will seek another big boost next year.

Capehart and Prices

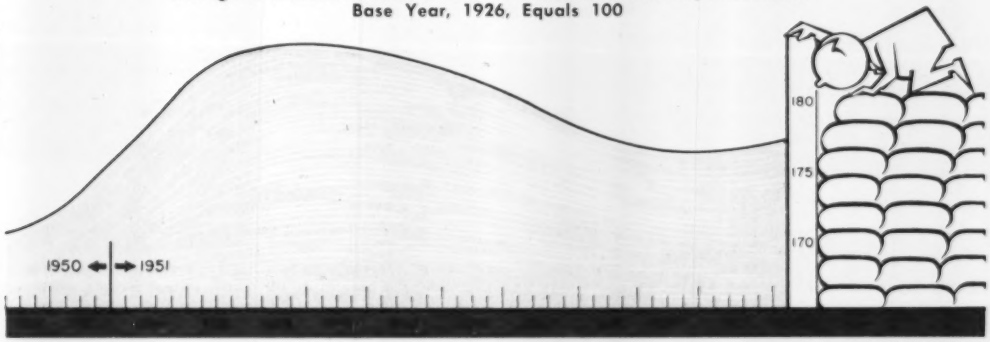
OPS implements the Defense Production Act amendment with legalistically worded rulings

THE BEDEVILED Office of Price Stabilization on Nov. 9 came to the end of a long waiting period characterized by suspense and confusion—suspense over what sort of price-fixing legislation Congress would insert in the Defense Production Act, and subsequent confusion as to how to apply the new language, and particularly the controversial Capehart amendment.

Clear the Air—On that day OPS came out with three new revisions to existing orders and announced that a fourth basic revision would be announced "within a few days." These are held by OPS officials to clear the air—both within and without the agency, so that from now on the pace in setting additional price ceilings should be much faster. Price Stabilizer Michael V. DiSalle promises that by the end of the first quarter of 1952 he will have issued upwards

River Rising: Another Big Price Wave Coming Up?

(Pictogram Based on Bureau of Labor Statistics All Commodity Price Index)
Base Year, 1926, Equals 100



of 500 "tailored" price regulations of which nearly 200 will apply to industrial materials and manufactured goods. The others will apply to such items as food, textiles, etc.

In the metals field, the long-expected steel warehouse price order "is just about ready to be put out." Shortly thereafter a ceiling price order will cover wire and cable. Others are in the works. For the present, at least, no price ceiling order is contemplated for steel products from the mills; the voluntary agreement with the steel producers will continue operative.

What They Mean—The revisions issued Nov. 9 provide that: Every concern subject to Ceiling Price Regulations 22 and 30 must file its prices before Dec. 19, 1951, with Capehart adjustments where desired, alternate methods of computing increased costs for the purpose of adjusting prices upward as permitted by the Capehart amendment.

The revisions containing those provisions are Supplementary Regulation 17 to Ceiling Price Regulation 22, SR 4 to CPR 30, Revision 1 to SR 1 to CPR 30, and Revision 1 to SR 2 to CPR 22. The last-mentioned revision is the one that is due within a few days.

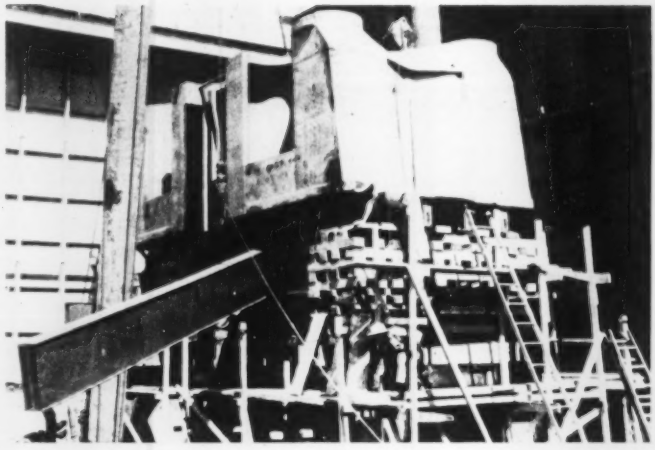
A Matter of Language—Careful reading of those revisions by all interested manufacturers is essential—and even OPS officials admit that will be no easy task in view of the language in which the lawyers have couched them. Careful reading is required, for example, to understand the Capehart formula for those manufacturers who do not use CPR 22 and 30 but prefer instead to base their prices on the general freeze that went into effect on Jan. 26, 1951.

What about companies not covered by CPR 22 and 30 and by the general freeze order? Companies like the foundries, for example, who are covered by the casting order, CPR 60? For their benefit OPS shortly will issue a general overriding regulation authorizing them to use, for purposes of making Capehart adjustments, formulae similar to those in the above-mentioned revisions to CPR 22 and 30.

Sales Up, but Not Enough

Sales of U.S. industrial supply and machinery distributors this year may exceed $4 billion, a $700 million rise over 1950. Although high, the 1951 record must be surpassed in 1952 to pay higher income taxes next year.

That summary was made at joint sessions of the American Supply & Machinery Manufacturers' Association and National Industrial Distributors Association in New York. The conference was the first of three sales meetings designed to bring together manufacturers and distributors in major industrial regions. Two more will be held at Chicago and Biloxi, Miss.



STRONGER BUT LIGHTER: This 2,370,000-pound forming press will form sheets into solid pieces up to 10 feet by 30 feet when completed for Lockheed Aircraft Corp. Exerting an 8000-ton pressure, the press is expected to produce large wing sections without a multiplicity of nuts and bolts. Thus, airplanes will be made stronger without extra weight. Because of its huge weight and size (four stories high), walls and roof will be built around the press after it is up

Aircraft Costs Soar

Americans are paying about 25 cents each per day to buy airplanes for the nation's defense, says Cyril Chappellet, vice president of Lockheed Aircraft Corp.

He points out that rifles, shirts and jeeps bought by the Armed Forces have doubled in cost since 1945 but that airplane prices have increased by 400-1300 per cent. But, says Mr. Chappellet, today's plane costs are based on production levels far below wartime peaks. Today's airplanes also require more assembly space, bigger and more complicated tooling, more extensive design work and tougher and heavier materials.

Disclosing previously restricted facts to explain the high cost of airplanes, the vice president reports development of Lockheed's prototype XP-38—which became the famed P-38 "Lightning" of World War II—in 1937 cost $612,000. Bill for development of the XF-90 in 1946 totaled $5,091,000. More costly machine tools up airplane costs. Comparing today's prices with those in August, 1941, he says a small milling machine costs Lockheed 56.3 per cent more, a No. 3 turret lathe 177 per cent more and a 6-ft planer 168 per cent more. Today's more complicated aircraft equipment boosts costs too: Radar in Lockheed's F-94 costs as much as a complete P-38 airframe did.

Mr. Chappellet believes the difference between current and 1945 costs lies largely in inflation, low production rates, and improved planes. If costs are compared at equal production rates expressed in dollars of equal value, he said, the F-94 cost is only 5 per cent more than the World War II Lockheed P-38.

Kaiser Gets Tin Plate License

John S. Nachtman, Washington, D. C., has just granted a license to Kaiser Steel Corp., under the Nachtman patents, for Kaiser Steel to engage in the manufacture of electro tin plate on the West Coast.

AEC Patents Available

Latest patent registry announcement of the Atomic Energy Commission includes two developments of interest to the metals industries. One is a rotary drill tool for cutting glass and other hard materials; the other is a process for production of radioactive iron.

The first is numbered 2,569,854 and the second 2,571,965. They are available for nonexclusive, royalty-free licensing; applications should be sent to the Chief, Patent Branch, Office of the General Counsel, Atomic Energy Commission, Washington 25, D. C.

New Kind of Scrap Drive in Racine

The Wisconsin county was the scene of a concerted one-day drive to contact every manufacturer for the maximum amount of the iron and steel material

A NEW TWIST to the old scrap drive was tried last Thursday at Racine, Wis.

A 35-man team of steel company salesmen descended upon Racine county for a day of concerted scouring for the iron and steel material. Every manufacturer in the county was asked by the salesmen to make an on-the-spot survey of his plant, give an estimate of the probable tonnage of iron and steel scrap and appoint a top executive with authority to make decisions as his plant scrap chairman.

Test Run—If the experiment proves a notable success, it may be repeated in other areas because the largest potential source of iron and steel scrap is in manufacturing plants. Some 2000 steel salesmen and 7000 steel warehouse salesmen in the U.S. are now spending about 40 per cent of their time hunting for scrap. Local scrap committees are today organized in more than 1000 communities.

The second largest source of scrap is the auto wrecker's yards. An estimated 2.5 or 3 million tons is lying in those yards. A government inventory order is due soon that will limit the time during which junker cars can be held and complete turnovers of inventory must be made. About 1 million tons of auto wrecker scrap may be produced by next February or March.

Scrap from Farms—Another large scrap source is farms. Through the Agriculture Department's Production & Marketing Bureau, an existing state, county and township committee setup is being used to urge the 6 million farmers in the country to scrap their old machinery.

Federal agencies are expected to yield large scrap tonnages. Some 900 Armed Forces camps, bases, shipyards, depots and air fields are good sources.

Negotiation—NPA's Salvage Division is negotiating with local municipalities, some federal agencies and companies to get more scrap from special sources where financial, legal or political reasons dictate special treatment. Such sources include sunken or non-serviceable ships, gutted battlefield equipment, abandoned bridges and streetcar rails and abandoned mining equipment. A commission has just returned from Korea and Formosa and reports that some 200,000 tons of scrap can be shipped from the Pacific area. Existing OPS ceilings on scrap make the problem of pulling up rails and repaving streets prohibitive at the moment, for such material would have to be sold at from $75 to $95 a ton. A few rail deals have been arranged where OPS permits a price of $70 a ton.

Just formed is a Nonferrous Scrap Mobilization Committee similar to the one for iron and steel scrap. At first, the hope was that nonferrous scrap would flow with the iron and steel drive, but that hasn't worked out.

Defense Department

ON ROTATION FROM KOREA: Salvageable scrap in Korea is sorted by the Army Ordnance Corps for shipment back to the U.S. Government sponsored representatives of the steel industry went to Korea in August to determine the amount of battlefield scrap and to make recommendations for its collection

Pennsy Expands Freight Yard

The Pennsylvania Railroad is pushing a $9 million reactivation and expansion of its Morrisville Freight Yard. Purpose: Better service for the new Fairless Works of U. S. Steel Co. and other industrial development in the Trenton-Morrisville-Bristol area of New Jersey.

Inactive for the past five years, the Morrisville Yard will become one of the most important freight classification yards in the East when in full operation late in 1953. Operations now carried on at the Coalport freight yard, Trenton, and at the East Trenton enginehouse will be fully transferred to new facilities at the Morrisville site. Among the improvements at Morrisville, 138,000 feet of track will be taken up, 70,000 feet of yard track will be shifted, and 150,000 feet of new track will be laid.

In July of this year the Pennsylvania Railroad announced construction of a 9,000 foot, double-track spur linking the Morrisville Yard with the Fairless Works and crossing the Philadelphia-New York Main Line over a steel and reinforced concrete viaduct.

DPA O.K.'s 123 Tax Certificates

DPA approved 123 certificates of necessity for accelerated tax amortization on new or expanded defense facilities between Oct. 18 and Nov. 13. Oct. 18 was the termination of DPA's 60-day moratorium on the issuance of amortization certificates. The new certificates bring the total of tax-aided expansion to $10 billion.

Major certificates granted to metalworking companies were to Youngstown Sheet & Tube Co. for a $42.5 million expansion at East Chicago, Ind.; to 18 projects for Colorado Fuel & Iron Corp., the largest being a $4.4 million expansion in New York; to Struthers Wells Corp., Titusville, Pa., for a $1.4 million ordnance proj-

ect; to Pittsburgh Coke & Chemical Co. for a $1.8 million generator plant in Pittsburgh; to Babcock & Wilcox Tube Co., Beaver Falls, Pa., for a $5.8 million project for special steels; to Briggs Mfg. Co., Detroit, for a $1.6 million project for aircraft controls; and Bendix-Westinghouse Automotive Airbrake Co., Elyria, O., for a $2.6 million program to build air brake equipment.

Top Chargers for McLouth

Conversion from side charging to top charging of McLouth Steel Corp.'s four electric furnaces at Trenton, Mich., has been completed. As a result the company's ingot capacity will be raised 35 to 40 per cent. It formerly was rated at 420,000 tons a year.

Gain in output is achieved by reduction in charging time. Whereas it took an average of 72 box-loads of scrap to charge each of the furnaces previously, each unit can now be charged with three loads from the largest clam-shell buckets in use in the steel industry. These have a capacity of 1130 cubic feet, measure 12 ft in diameter and 10½ ft high. Empty weight of the buckets is 15 tons.

The Trenton plant until now has had an excess of rolling capacity to ingot capacity and has been able to break down customer-supplied ingots into finished steel. With conversion activity on the wane, the step-up in ingot production is particularly timely for the corporation.

McLOUTH'S CONVERSION
. . . from side to top charging

Inflation—Steel Style

Steel institute president, Walter Tower, says government has inflated idea of demand

THE GOVERNMENT has an "inflated idea of steel demands." So says Walter S. Tower, president of the American Iron & Steel Institute, who spoke at the fourth annual regional conference of the institute in San Francisco.

Actual tonnage required for direct defense production now is about 1 million tons a month, "and the industry can turn out a year's supply for that purpose in two months," reports Mr. Tower. "The idea of controlling the whole industry for the sake of two months' production is like the tip of the tail wagging the whole dog."

Atmosphere of Scarcity—"There's an artificial atmosphere of scarcity as to steel," he believes. "It happens any time you put on controls. If controls were taken off, there would be more steel production than needed within six to nine months."

Mr. Tower estimates that by 1953 steel plants in California, Oregon, Washington, Utah and Colorado will have an annual capacity of 6,670,000 tons of ingots and steel for castings, or 5.7 per cent of the national total. At the meeting, Jack L. Ashby, vice president and general manager of Kaiser Steel Corp., presented figures to show that enough metallic resources exist in the area to support for more than 50 years steel productive capacity at least twice as large as is now in operation.

More Capacity—Kaiser, Mr. Ashby reveals, is working on plans for the financing of a third blast furnace and an additional 90 coke ovens. Total western blast furnace capacity, he predicts, will be increased to 5 million tons by 1960 to provide for a doubled steel capacity. By 1960 the normal annual scrap return in the West will amount to 3 million tons, an increase of about 1 million tons over 1950 consumption.

Steel Production Sets New Monthly Mark

MORE STEEL was made in the United States in October than in any month in history.

Total output for ingots and castings was 9,096,000 net tons, the American Iron and Steel Institute reports. To attain this mark, the industry operated at 102.7 per cent of capacity. The only other months in which the 9-million figure was exceeded were March and May of this year.

Production in the first ten months of this year was 87,435,639 tons, surpassing the 12-month output of any year except 1950, 1948, 1944, and 1943. Details of the 1951 production by months follow:

	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated	Number
1951	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	weekly production (Net-tons)	of week in months
January	7,844,982	101.4	431,725	90.4	566,460	88.3	8,843,167	99.9	1,996,200	4.43
February	6,935,512	99.3	326,112	75.6	504,077	87.0	7,765,701	97.1	1,941,425	4.00
March	8,059,625	104.2	408,926	85.6	602,504	93.9	9,071,055	102.4	2,047,642	4.43
1st Quar.	22,840,119	101.7	1,166,762	84.2	1,673,041	89.8	25,679,923	99.9	1,996,884	12.86
April	7,857,161	104.9	392,472	84.9	590,888	95.1	8,840,521	103.1	2,060,728	4.29
May	8,071,270	104.3	408,650	85.6	614,579	95.7	9,094,499	102.7	2,052,934	4.43
June	7,667,811	102.3	403,001	87.1	586,148	94.3	8,656,960	100.9	2,017,939	4.29
2nd Quar.	23,596,242	103.9	1,204,123	85.9	1,791,615	95.0	26,591,980	102.2	2,043,965	13.01
1st 6 mo.	46,436,361	102.8	2,370,886	85.0	3,464,656	92.4	52,271,903	101.1	2,020,561	25.87
July	7,704,433	99.8	411,599	86.4	563,215	87.9	8,679,247	98.2	1,963,631	4.42
August	7,693,322	99.4	436,822	91.5	603,448	94.0	8,733,592	98.6	1,971,465	4.43
September	7,652,167	102.6	404,726	87.7	598,004	96.4	8,654,897	101.2	2,022,172	4.28
3rd Quar.	23,049,922	100.5	1,253,147	88.5	1,764,667	92.8	26,067,736	99.3	1,985,357	13.13
1st 9 mo.	69,486,283	102.0	3,624,033	86.2	5,229,323	92.5	78,339,639	100.5	2,008,709	39.00
†October	8,012,000	103.6	458,000	95.9	626,000	97.5	9,096,000	102.7	2,053,000	4.43
1950										
October	7,734,714	103.6	436,835	91.5	581,137	96.6	8,752,686	102.4	1,975,776	4.43

Note—The percentages of capacity operated in 1951 are calculated on weekly capacities of 1,746,337 net tons open-hearth, 107,806 net tons bessemer and 144,891 net tons electric ingots and steel for castings, total 1,999,034 net tons; based on annual capacities as of Jan. 1, 1951, as follows: Openhearth 91,054,020 net tons; bessemer 5,621,000 net tons; electric 7,554,630 net tons; total 104,229,650 net tons.
* Revised. † Preliminary figures, subject to revision.

New England Gets Extension

New England Steel Corp.'s application for extension of the certificate of necessity covering its projected new steel plant in Connecticut has been acted on favorably by Defense Production Administration. The extension is for four months beyond the Nov. 11 expiration date.

U.S. Steel's West Units Merge

Another phase of the U. S. Steel Corp. corporate structure simplification plan (STEEL, Nov. 12, p. 51) will be the consolidation of two of its big far-western operating units—Columbia Steel Co. and Geneva Steel Co.

Those subsidiaries—to be known as the Columbia-Geneva Division—and others of the U. S. Steel group will become general operating divisions of U. S. Steel Co., the major subsidiary involved.

Under the new set-up, effective

January 1, Alden G. Roach, president of Columbia and of Consolidated Western Steel Corp., also a U. S. Steel subsidiary, will become president of the Columbia-Geneva division. He will have three headquarters—San Francisco, Los Angeles and Salt Lake City.

Loren J. Westhaver, vice president and manager of operations, Geneva Steel and Columbia Iron Mining Co., will become vice president and manager of Utah operations, where the Geneva firm has its big mill.

Dr. Walther Mathesius, president of Geneva Steel since 1943, will retire Dec. 1, having reached U. S. Steel's compulsory retirement age of 65 years.

Venders Break Even

Vending machine makers point to war uses of their product while trying to get defense work

"AUTOMATIC vending machines have a very definite degree of essentiality in any preparedness program," said Sen. John Sparkman (Dem., Ala.) speaking at the fifth annual conference last week of the National Automatic Merchandising Association in Cleveland.

Manufacturers of the equipment hope that this means no more cuts in allotments of steel, copper and aluminum. They say they're down to break-even production now. Any further cuts would raise per-unit costs to where there is no profit in their operations.

Like all other non-primary defense producers, vending machine makers' allotments were cut 30 to 50 per cent for the fourth quarter this year, will be further reduced for first quarter, 1952. Production has dipped 40 to 50 per cent, even though substitutes are being used—less stainless steel and more plastics and glass. The real limiting factor is copper, for which they have no substitute in their intricate electrical and refrigeration assemblies.

From Ice Cream to Perfume—The industry has 25 standard producers, with again that many marginal makers, the biggest ten manufacturers doing 80 per cent of the volume. There is no average price for a vender, since they vary according to size, type, and accessories. Rowe Mfg. Co., for example, has a new seven-column candy bar vender which lists for $178, including a nickel changer. Optional extras for this unit include an adapter permitting the sale of nickel gum, mint rolls, or charms and a penny refunder. Other machines give out with everything from hot sandwiches to note paper, hosiery to napkins, ice cream to perfume.

Most vending machine makers are trying to cross the line into other defense production. Some are as much as 50 per cent over the line right now. One company is filling a contract for a 10,000-part defense landing kit for dropping jeeps and other heavy equipment from airplanes. This company is also doing electronics work. Another company is making Jato rockets, rocket takeoff-assist units.

Venders Go To War—Still, manufacturers of vending machines believe that their primary product deserves enough metals under CMP to survive because of the use to which the machines are put. The automatic merchandising industry congealed during World War II, when the need for handy, inexpensive refreshments brought the machines into war plants and Army PXs. Now, the shift is back to the war plant and PX. Of the 2,352,483 venders in use in September, defense plants had 1,133,594 and military locations had 144,529.

This, they say, is reason enough to keep the industry alive during the emergency.

ALL STEAMED UP: Clouds of steam rise from railroad cars in Duluth Harbor as dock workers thaw out frozen iron ore during a recent icy spell. Loading, which normally takes four hours, takes 72 hours when ore frozen in the railroad cars must be thawed with steam. About 67 ore carriers were jammed up in Duluth-Superior Harbor waiting to be loaded as the Eastern steel mills begged for more iron ore

In the Middle

That's where many metal stampers are as civilian work drops, defense jobs don't gain

THE NATION'S dual economy threatens to catch metal stampers in the middle.

The government's restrictions on consumer durables output—particularly automobiles—has dealt the industry a body blow, which is not yet cured by defense business.

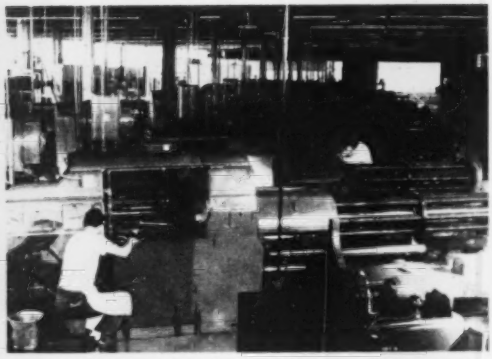
Troubles — The jobbing stamping shops—which will do 60 to 65 per cent of the industry's estimated $900 million volume this year—had only about 16 per cent of their volume going for defense purposes in September, the latest month for which figures are available, and that was no improvement over the ratio last June. Now the average may be slightly higher, but not much. Captive pressed metal shops are devoting a considerably higher proportion of their capacity to defense. That's a factor complicating the industry's problems.

Under the present limited war conditions, the defense needs for stamping facilities are not as great as in all-out war because pressed metal facilities are best suited to produce expendable items. Proportionately more of the limited amount of defense work is going to captive shops, largely because they are parts of big organizations that win primes.

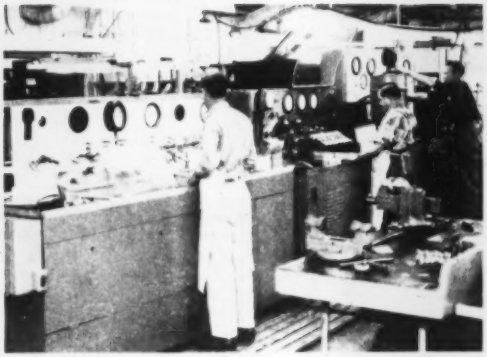
Net Result—The upshot of the situation is that many jobbing shops find themselves in a precarious position. Shipments now are 10 per cent below what they were last June and order backlogs are 6 per cent off from June. Some of the smaller shops with few or no defense orders have had to go out of business.

The only answer to the problem, points out E. M. Ross of the Pressed Metal Institute, Cleveland, is more aggressive action by management to get prime and subcontracts. Some companies such as Worcester Pressed Steel Co., Worcester, Mass., that have bettered the 16 per cent average for defense work find themselves in comparatively good shape.

Incidental Benefit—At least some good has resulted from declining demand for stampings. The materials situation is a little better than it was last summer. But Mel G. Kennedy, vice president of Ferro Stamping & Mfg. Co., Detroit, cautions that "CMP has nothing to do with it." Most stampers echo the sentiments of Charles A. Kays, president of Acme Stamping & Mfg. Co., Pittsburgh, who thinks that CMP controls are more a hindrance than a help.



SCREW MACHINES GO WEST: Shifting production of aircraft hydraulic and fuel system valves and fittings, Parker Appliance Co., Cleveland, moved a large battery of New Britain and Acme-Gridley automatic screw machines to its subsidiary, Parker Aircraft Co., Los Angeles. Output has zoomed up 500 per cent over pre-Korean levels



FOR FASTER FUELING: Each fuel valve passes through an inspection sequence at Parker's West Coast plant and each assembly is proven with actual aviation gasoline flowing at rates of 200 to 1200 gallons per minute. The Hi-Flow valves allow fuel tanks on B-36 Bombers to be filled in 55 minutes instead of conventional six to eight hours

New Officers of NMTBA

Newly elected president of the National Machine Tool Builders' Association is Frederick S. Blackall Jr., president of Taft-Peirce Mfg. Co., Woonsocket, R. I.

Also elected at the association's fiftieth annual meeting in Hot Springs, Va., were the following officers: Swan E. Bergstrom, Cincinnati Milling Machine Co., as first vice president; Herbert L. Tigges, Baker Brothers Inc., Toledo, O., as second vice president and director; and Jerome A. Raterman, Monarch Machine Tool Co., Sidney, O., as treasurer.

Mr. Bergstrom was given leave of absence while he serves as director of the Metalworking Equipment Division of the NPA.

New directors elected, in addition to Mr. Tigges, were: Ralph S. Howe, executive vice president, New Britain Machine Co., New Britain, Conn., and William A. Dermody, president and general manager, Carlton Machine Tool Co., Cincinnati.

Tell Berna was re-elected general manager of the association and Mrs. Frida F. Selbert was re-elected secretary.

PEI Elects New Officers

Elected for his second term as president of the Porcelain Enamel Institute is R. A. Dadisman of Armco Steel Corp.

At its annual meeting in White Sulphur Srings, W. Va., the PEI also elected two new vice presidents: E. O. Brady, Briggs Mfg. Co., and R. C. Myers, U. S. Steel Co. W. A. Barrows, Barrows Porcelain Enameling Co., and H. H. Winebaugh, Texlite Inc., were re-elected vice presidents.

Aircraft Industry Still a Good Bet for Subs

YOUR BEST BET for subcontracts is still the aircraft and allied fields.

High Air Force officials are needling the government to push mass production of latest-type aircraft. The Air Force points to high quality Communist equipment in Korea and says it wants comparable equipment as soon as it can be had.

The government is being generous with aircraft contracts: Seven of the ten largest manufacturers who have received 40 per cent of all prime defense contracts are airplane makers.

The aircraft industry is putting a forced draft under expansion programs, again with government blessings and help. Two recent examples: Pratt & Whitney Aircraft Div., United Aircraft Corp., is constructing a 180,000-square foot addition at Hartford, Conn.; Fairchild Engine Div., Fairchild Engine & Airplane Corp., is spending $6 million of its own and the government is financing more than $7 million in plant expansions in New Jersey, Maryland, Illinois.

Even with all this, airplane makers don't have a chance to make good on production schedules for new models unless they subcontract.

Chrysler Corp. has a multi-million dollar contract for production of Hamilton Standard propellers under agreement with United Aircraft Corp. A large number of other companies throughout the country will be needed to supply components.

Other government contracts awarded, in excess of $250,000, follow:

Product	Contractor
Finish Trim and Burr Machines	Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Processing Machines	Houston-Fearless Corp., Los Angeles
Machine Tools and Equipment	Muncie Gear Works Inc., Muncie, Ind.
Machinery and Equipment	Servel Inc., Evansville, Ind.
	Fairchild Engine & Airplane Corp., Farmingdale, L. I., N. Y.
	Deepfreeze Appliance Div., Motor Products Corp., Chicago
	Houdaille-Hershey Corp., Decatur, Ill.
	Rheem Mfg. Co., Downey, Calif.
	Sundstrand Machine Tool Co., Rockford, Ill.
	General Electric Co., Lockland, O.
	Easy Washing Machine Corp., Syracuse, N. Y.
	Jacobs Aircraft Engine Co., Pottstown, Pa.
	Beaver Precision Products Inc., Clawson, Mich.
	Victor Adding Machine Co., Chicago
Gasoline Tent Heaters	United Stove Co., Ypsilanti, Mich.
Dishwashing Machines	Hobart Mfg. Co., Troy, O.
Field Chests	Reynolds Metals Co., Louisville
Shock Struts	Bendix Products Div., Bendix Aviation Corp., South Bend, Ind.
Wheel & Brake Assemblies	Goodyear Tire & Rubber Co., Akron, O.
Controllable Pitch Propellers and Shafting	S. Morgan Smith Co., York, Pa.
	Farrell-Birmingham Co., Ansonia, Conn.
Gasoline Valves	Atwood & Morrill Co., Salem, Mass.
Maintenance Parts for Aircraft (2 contracts)	Chance Vought Aircraft Div., United Aircraft Corp., Dallas
	Hamilton Standard Div., United Aircraft Corp., Hartford, Conn.
	El Segundo Div., Douglas Aircraft Co., El Segundo, Calif.
Spare Parts for Aircraft (3 Contracts)	Pratt & Whitney Aircraft Div., United Aircraft Corp., Hartford, Conn.
Repair Parts for Radiators	Harrison Radiator Div., General Motors Corp., Lockport, N. Y.
Spare Parts for J-33 Turbojet Engines	Allison Div., General Motors Corp., Indianapolis
Generators	Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.
Magnetos and Ignition Harness Assemblies	Scintilla Magneto Div., Bendix Aviation Corp., Sidney, N.Y.
Components for Radar Sets	General Electric Co., Syracuse, N. Y.
Amplifiers	Olympic Radio & Television Inc., Long Island City, N. Y.
Cabinet Kits for Radar Equipment	Western Electric Co., New York
Radio Tubes (4 contracts)	RCA Victor Div., Radio Corporation of America, Harrison, N.J.

Help Wanted in San Diego

San Diego, Calif., defense plants need more workers. Four aircraft producers in the area, Consolidated Vultee Aircraft Corp., Rohr Aircraft Corp., Ryan Aeronautical Co., and Solar Aircraft Co., will add 14,000 workers to the 30,000 now on payrolls.

Less Farm Equipment for '52

A 20 per cent decline, which may slip to 30 or 35 per cent, in the manufacture of farm machinery is forecast for 1952 by A. King McCord, president of Oliver Corp.

The prediction is based on NPA's allotment of 544,000 tons of steel to farm equipment makers in the first quarter of 1952 after a nationwide survey revealed that 750,000 tons of steel were required. Mr. McCord said allocations of copper and aluminum were not enough to match the steel granted and may result in a further production loss.

Structurals: Same Shape

Allotments will be the same for the first quarter of next year as for this quarter

ALLOTMENTS of structural steel for the first quarter of 1952 will be about the same as they were during the fourth quarter of 1951.

Slightly Higher—For the first three months of next year, about 900,000 tons of an estimated supply of 1,425,000 tons has been allocated. That compares with the fourth quarter allotments of about 890,000 tons out of a total supply of 1.3 million tons. Demand for structurals in the first quarter is more than 200 per cent of supply, so claimant agency programs had to be reduced on the average to 50 per cent of the stated requirements.

Agencies that were cut back more than 50 per cent of their stated requirements include the Department of Agriculture, Civil Aeronautics Administration, Defense Fisheries, Defense Transport Administration, Federal Civil Defense Administration, ECA and Office of International Trade, Bureau of Public Roads, Federal Security Agency's school program and NPA's divisions for building materials, construction machinery, consumer durable goods, electrical equipment, electronics, motion pictures and photographic products, scientific and technical equipment and water resources.

Complaints Answered—A claimant agency that had the sharpest cuts was the Bureau of Public Roads which will receive only 50,000 tons, less than 28 per cent of what it asked for. Defense Production Administration, which made the allocations, admits that much road construction will have to be deferred. The Federal Security Agency's complaints about the cutback in schools are countered by DPA's claim that 300 new schools can be started next quarter. Housing & Home Finance Agency got 10,500 tons or 53.3 per cent of what it wanted. DPA says that will be enough to carry forward the 95,000 units of public housing now under construction, as well as 45,000 private multi-unit projects underway. The Maritime Administration also protested its 48.9 per cent cut from what it requested, but DPA claims that enough ships can be built and repaired to meet America's needs.

NPA's Facilities & Construction Bureau won more structural steel for next quarter than it's getting in this, in order to meet the requirements of steel, aluminum and a few other major expansion programs.

U.S. Clamps Down on Building

The government permitted only 63 per cent of 3384 non-essential construction projects scheduled for this quarter to go ahead.

About $420 million worth of commercial, religious, entertainment and community construction can proceed in the fourth quarter. The applicants requested 264,857 tons of steel, 7,144,838 pounds of copper and 1,792,185 pounds of aluminum. NPA allotted only 39,640 tons of steel, 258,794 pounds of copper and none of the aluminum.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

MACHINE TOOLS — NPA Order M-41A issued Nov. 8, 1951, amendment of Nov. 8, 1951, of NPA Order M-41 and revocation of Nov. 8, 1951, of NPA Order M-40 provide new and tighter regulations on sales of machine tools. M-41A limits priority ratings to buy machine tools; only companies operating at a government-authorized production rate higher than in the first quarter of 1951 are eligible for priority ratings to purchase machine tools. There are some exceptions to this order, including one which permits applications from any company which needs to replace a worn-out machine tool. Amendment of M-41 places a lid on machine tool shipments for unrated orders after Feb. 1, 1952; an important exception to this limitation is the case of a machine tool manufacturer whose scheduled shipments on rated orders is below 70 per cent of his average shipments during the first six months of 1950. M-40, which provided materials priorities for machine tool builders having pool orders, was made obsolete by the Controlled Materials Plan.

COLUMBIUM AND TANTALUM — Amendment of Nov. 8, 1951, of schedule 5 to NPA Order M-80 permits use of columbium and tantalum in the manufacture of Class B products which are for delivery to the Department of Defense or Atomic Energy Commission.

SULPHUR — Amendment of Nov. 9, 1951, of NPA Order M-69 limits sulphur inventories to a 45-day supply at currently scheduled rates of operation or to a practicable working inventory, whichever is less.

NPA Notice

SCARCE MATERIALS — Amendment of Nov. 7, 1951, of NPA Notice 1 adds scores of items to the list of materials and products which are designated as scarce and which are subject to anti-hoarding provisions of the Defense Production Act. Nine materials and products, now in more plentiful supply, are removed from the list.

Price Regulations

MANUFACTURERS' PRICES — Supplementary Regulation 17 to Ceiling Price Regulation 22 provides for optional adjustment of manufacturers' ceiling prices under the Capehart Amendment to the Defense Production Act of 1950. This amendment provides for inclusion of costs in addition to those provided in the original regulation and gives a later cutoff date for figuring cost increases. SR 17 was issued Nov. 9, 1951. Amendment 33 of CPR 22 orders CPR 22 to become effective no later than Dec. 19, 1951. Amendment 33 was issued Nov. 9, 1951.

MACHINERY PRICES — Supplementary Regulation 4 to Ceiling Price Regulation 30 provides for optional adjustment of prices on machinery and related manufactured goods under the Capehart Amendment to the Defense Production Act of 1950. This amendment provides for inclusion of costs in addition to those provided in the original regulation and gives a later cutoff date for figuring cost increases. SR 4 was issued Nov. 9, 1951. Supplementary Regulation 1 to Ceiling Price Regulation 30 was revised Nov. 9, 1951, to make it conform with SR 4, and Amendment 20 of CPR 30 was issued Nov. 9, 1951, to make Dec. 19, 1951, the latest effective date for application of CPR 30.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Standardization of industrial engines and parts used by military is coming . . . Government secrets are being declassified for use by industry . . . Vapor plating data ready

ENGINE and engine parts manufacturers will soon be invited to Washington, or possibly Ft. Belvoir, Va., by the Munitions Board and Army Corps of Engineers.

Purpose of the meeting is to brief the engine makers on findings from four years' research by the Army engineers aimed at standardization of industrial gasoline engines and parts used by the Army, Navy and Air Force. Emphasis is on maximum interchangeability of parts within limits of available machine tools and current designs.

A survey made by the engineers covered gasoline, 4-cycle, air and water-cooled engine with 2⅞ to 4⅛-inch bore made by 149 firms. It disclosed 138 different engine models being produced in that range with 15 different cylinder bore diameters. They required 1187 different, high-mortality, fast-moving parts.

These 15 bore sizes were reduced to five basic sizes in a range of 3 to 4 inches. Additional studies of the five sizes revealed the number of parts potentially may be reduced to a family of 63 parts. That would mean a tremendous simplification of industrial engine procurement and repair parts.

Current plans call for expanding the program with the continued co-operation of the industry to cover larger bore sizes in gasoline engines and also in diesel engines.

Of Life and Limb . . .

FBI's G-men and Treasury's T-men aren't the only government civilian employees that have to risk their lives frequently as part of their jobs. Bureau of Mines' new director, John J. Forbes, ranks near the top in dangerous tasks performed.

For many years with the bureau's Health and Safety Division, of which he ultimately became chief, Mr. Forbes worked in more than 50 mine disasters. His first

JOHN J. FORBES
. . . new Mines Bureau chief

experience, typical of many others that came later, was in 1917, when he was assigned to rescue work in a mine fire at North Red Lodge, Mont. He made his way through the mine to the 2200-foot level where eight men were trapped and helped get them all out alive.

Mr. Forbes succeeds Dr. James Boyd who resigned as director of the bureau to join the Kennecott Copper Co. Other appointments in the bureau include: Charles W. Merrill, named assistant chief of the Minerals Division; and Charles H. Johnson, named chief of the Base Metals Branch.

12 Miles of Secrets . . .

Army's Security Classification Review Branch, digging into World War II "secrets," has found that about 87 per cent of the material processed so far can be released to the public. Scheduled for review are over 28 million classified documents —a stack of papers 12 miles high.

Industry can benefit from this declassification. Office of Scientific Research and Development made numerous reports on metallurgical findings that could save researchers' time in certain studies. One manufacturer asked for details on a type of steel processing OSRD had studied during the war —and had it declassified.

The branch is fighting a tough battle with current Army accumulations. (It measures classified documents in linear feet). An attempt will be made to review whole areas of material rather than every paper in that category.

Boost for Aluminum . . .

Establishment of a separate Office of Aluminum within DPA foreshadows efforts by government to further expand bauxite, alumina, aluminum, aluminum fabrication, secondary melting and cryolite programs. The agency is empowered not only to develop new programs but to negotiate new ones. In charge of the new office as Deputy DPA Administrator for Aluminum is Samuel W. Anderson, who was with the War Production Board in World War II.

Plating with Vapor . . .

A meaty report on the research conducted for the Air Force by Battelle Memorial Institute on the new vapor plating process now is available.

The report embodies all information obtained to date on putting coatings on surfaces used in high-temperature service (jet engines in particular). The coating materials are high-melting metals, or the refractory borides, silicides, carbides and nitrides of these metals. Such coatings cannot be applied by the conventional processes generally used—electroplating, evaporating, and sputtering—so a technique has been developed for depositing them in the vapor form.

The report (order number PB 104288) is in mimeographed form and can be obtained for $2.75 from Office of Technical Services, Department of Commerce, Washington 25.

A NEW *Star Performer*

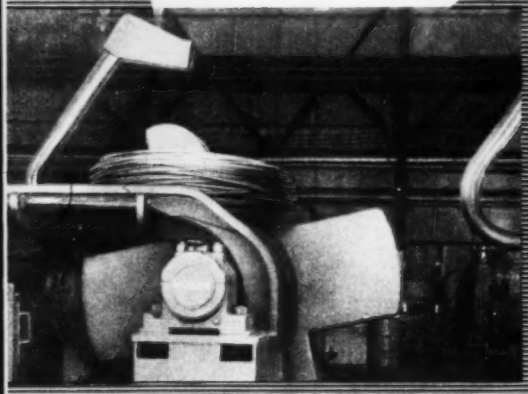
One of the objectives of rolling mill designers is to simplify handling operations. One visit to a modern Morgan mill and you will be amazed at the proficiency with which heavy billets, rods and heavy coils are moved.

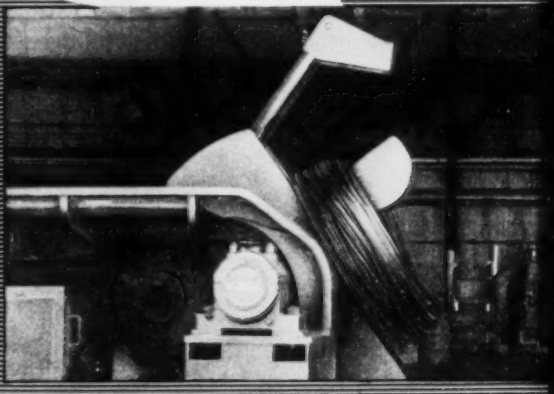
Take the problem of transferring a coil from a flat conveyor to a hook carrier. The new Morgan Star Wheel Takeoff* is the rolling mill designer's answer.

Notice in the three pictures how the hook carrier moves in behind the coil as it is tipped by the star wheel. The hook then lifts the coil clear and conveys it to the loading deck.

Other new Morgan innovations will be described in future advertisements . . . but let us tell you about them now.

*Patent Applied For





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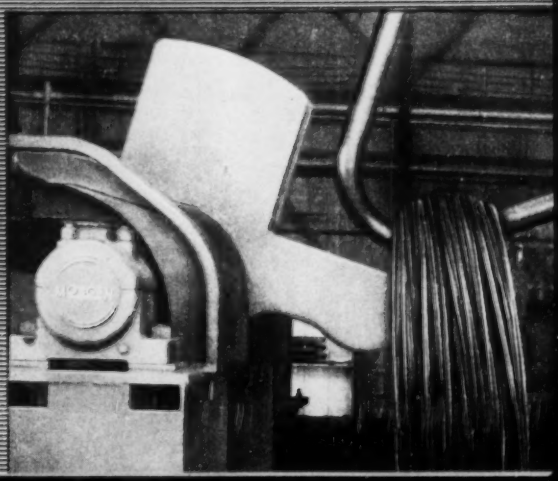
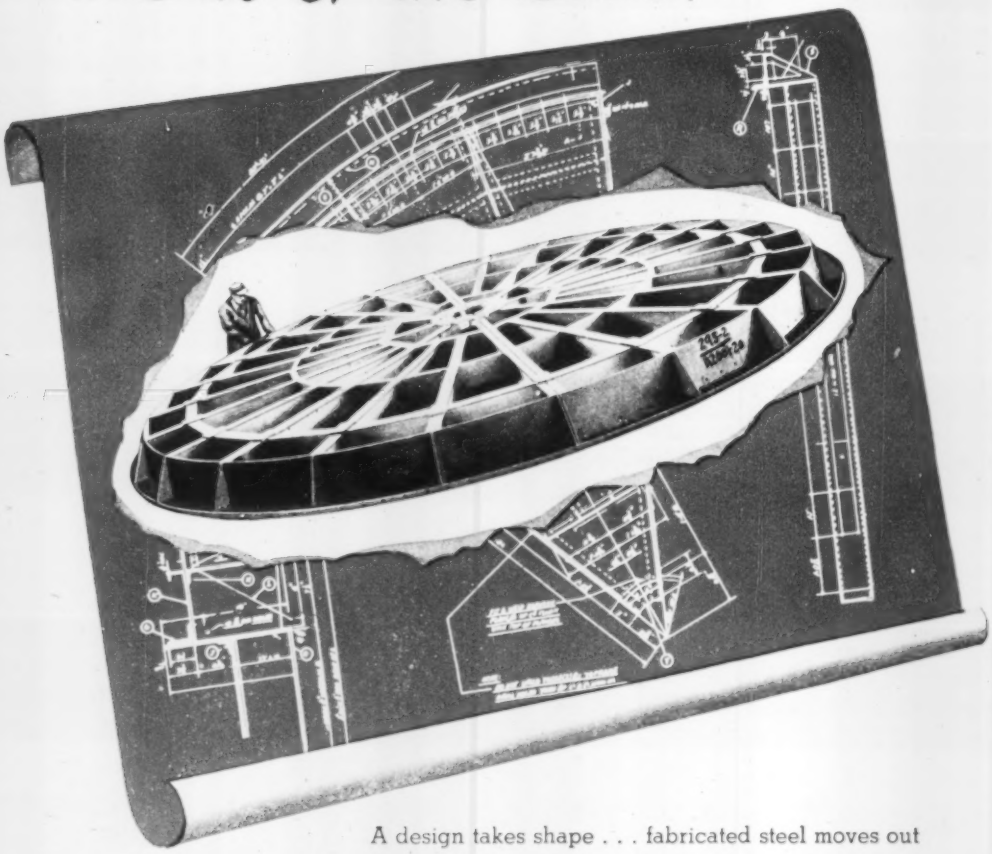


...Out of the Blue!



A design takes shape . . . fabricated steel moves out on time . . . accurate workmanship and close adherence to "specs" the keynote. • Columns and trusses for new plants, highly fabricated steel for conveyors and coke ovens, intricate chute and hopper work, turn-tables for rotary furnaces . . . all tailor-made to meet the rigid demands of today's defense mobilization program. • Accomplishing the unusual in the usual way is a matter of *routine* at Levinson's.

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LS-20

West Europe Boosts Defense Spending

France puts 9.3 per cent of its national product into defense; Britain 8.8 per cent. Hard goods spending for NATO nations will hit $2.5 billion in 1952

DEFENSE efforts by Western European countries are "more encouraging," says Economic Cooperation Administration.

The agency's thirteenth quarterly report to Congress, for the April-June period, may be its last because under recent legislation ECA will be abolished and the Mutual Security Agency will assume the job of directing America's financial assistance to other nations.

Higher—ECA estimates that defense expenditures of nine European North Atlantic Treaty Organization (NATO) countries have increased from $4.4 billion in the fiscal year beginning in 1949 to $8 billion in 1951. France is putting 9.3 per cent of its gross national product into defense; the United Kingdom 8.8 per cent. European NATO nations expect to increase their production of military hard goods from about $1.5 billion in 1951 to an estimated $2.5 billion in 1952.

Industrial production in Western Europe climbed to a new high in the second quarter of 1951 when output averaged 43 per cent above prewar and 14 per cent higher than a year earlier. Steel production was the highest in the postwar period, but coal mining continues to lag and Western Europe this year will have to import 25 million tons from the U. S., involving an outlay of about $500 million, including the shipping costs.

Monumental Aid—Aid extended to foreign countries by the U. S. in the form of grants and credits totaled $32.7 billion in the postwar period, as of last June 30. When capital investments of $3.4 billion in the International Bank for Reconstruction & Development and the International Monetary Fund are also included, the U. S. postwar assistance as of last June 30 amounts to $36.1 billion. Of that sum, $12.3 billion had been distributed through ECA, as of midyear.

Total aid in fiscal 1951 hit $4.7 billion. It will reach $7.5 billion in fiscal 1952, 80 per cent of which will be for military purposes. In the second quarter of 1951 the trade gap of ECA countries with the rest of the world rose to the largest figure since 1947—averaging $650 million a month. That's caused primarily by the higher cost of imported materials since Korea.

The Reason Why—The trade-gap situation dictates Britain's desire to get more American aid, even though only 11 months ago she said she no longer needed ECA help. Britain expects to get actual money—not aid in goods and equipment—from the Paris-based Financial & Economic Board of the Atlantic Pact.

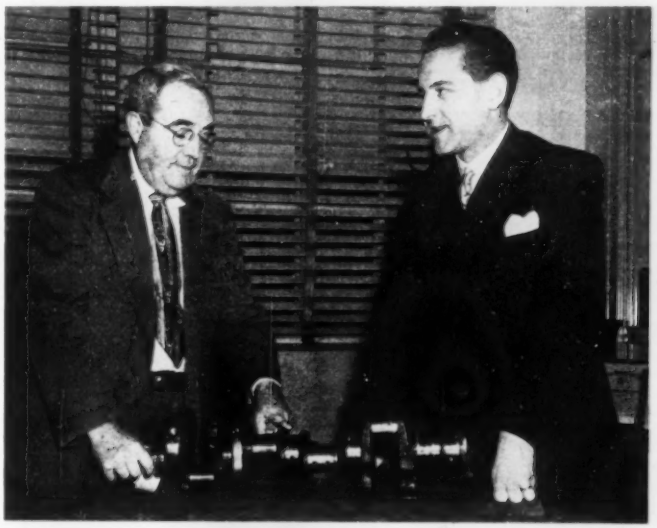
A cash allocation represents a departure in U. S. policy. Most military and ECA assistance is in goods, not actual money. Total U. S. exports to Marshall Plan nations have increased more than 50 per cent since the beginning of Korean hostilities, primarily because some $729 million worth of American military goods went to the countries in the first year after the Korean war began. The Commerce Department's Office of International Trade reports that U. S. imports from ECA countries increased from $483 million in January-June, 1950, to $777.6 million in the succeeding half-year, and to $1025.9 million in the first half of 1951. Exports in the same half-year periods rose from $1539.4 million to $1626.3 million and then to $2374.5 million.

Ruhr Price Controls Falter

The controlled price system on iron and steel in West Germany is breaking down. Even the unions want the setup thrown out.

The charge is that artificial price levels foster gray markets. Gray market activity is now common in the Ruhr, many industrialists justifying their transactions on the grounds that such activity is the only way they'll get enough capital to modernize their plants. Price controls, they charge, also hold down scrap collections.

Orders for steel sheets, plates, strip, wire rod and structurals can hardly be placed with German rolling mills. Delivery periods extending to three years are becoming more frequent. American buyers can still occasionally get better deliveries than that because they pay in precious dollars. They can even win price discounts. Export quotations on merchant bars to the U. S. and Canada now average $130 to $134 per metric ton, compared with $140 to $145 to European countries. Sheet prices range from $215 to $280 to U. S. and Canada; $230 to $295 to European countries.



RECOGNIZE IT?: When he visited Studebaker Corp., South Bend, Ind., Marcel Nepper (right), chief metallurgist for John Cockerill Co., Seraing, Belgium, saw the actual use of steel imported from his country. William J. Harris, Studebaker's chief metallurgist, displays a crankshaft made from Cockerill steel. Mr. Nepper and Prof. Pierre Coheur, University of Liege, presented papers before the World Metallurgical Congress in Detroit

Peacetime Customers: Toolbuilding Subs

Subcontractors will produce a third of the $1.5 billion annual machine tool production rate next July. That's greater volume than the industry did in most postwar years

By SAM BAKER, Assistant Editor

MACHINE TOOL builders are calling on their customers to help them make the tools needed for mobilization. By next July, subcontractors—normally customers of the machine tool industry—will be producing 30 to 35 per cent of the industry's total output.

If volume reaches the government goal machine tool production will be at annual rate of $1.5 billion by mid-1952. Thus the industry's customers, converted to subcontractors, would be producing a greater volume than the machine tool industry itself did in any postwar year except 1951. A National Machine Tool Builders Association survey of 93 major tool builders also shows that about 15 per cent of total shipments at the end of 1951 will be from subcontractors.

Snowballing—Order load on the industry now stands at $1.3 billion—about 23 months of production at current shipment rates. Still to be ordered by next July is an additional $1.5 billion. Output at the end of this year will be at an annual rate somewhere between the industry's prediction of $610 million and the government estimate of $675 million.

Who can build all those machine tools? In general they are capital goods industries akin to machine tool builders employing skilled workmen, utilizing precision machinery in similar plant facilities, working with the same raw materials to exact tolerances and with a sound knowledge of production planning peculiar to the tailor-making of machinery.

Qualified—Filling these general requirements are a good portion of the tool builders' best peacetime customers: Makers of printing press and other graphic arts equipment, pulp and paper machinery, canning machinery, food processing machinery, woodworking machinery, and textile machinery. Limited help, but only limited, could be given by the automobile industry. Only the tool rooms of the auto industry could be used extensively for machine tool production; its mammoth overall capacity could be better utilized turning out military end products. Its production equipment is too much of a special purpose nature for extensive use in machine tool building. Sizeable work loads have been passed on already to meat machinery manufacturers and rubber working machinery people, says the National Production Authority. Even such unlikely sources of help as office equipment and coin machine manufacturers did a good job on machine tool production in World War II.

Employment in the machine tool industry today is close to 60,000. In allied capital goods industries are 25,000 to 28,000 men skilled in the arts of producing close tolerance machines. To meet the predicted goal they'll have to be used at about twice the World War II rate, when some 20 per cent of the manhours used to produce machine tools and parts were subcontract hours.

Logic—Subcontracting makes sense, and here are a half-dozen reasons why it's being favored by tool builders:

Speed—It's the fastest means of increasing total output volume.

Manpower—It utilizes skilled labor where employed, without disruption.

Plants—It reduces the need for new plants, which take too much time and a lot of money to build.

Prices—Its increased costs can be included in selling price.

Stability—It keeps intact management and engineering teams for normal production after the emergency.

Assurance — It doesn't create a Frankenstein monster. Subs couldn't compete pricewise with tool builders in the machine tool market, even if they wanted to.

Tool builders, realizing the soundness of the logic, are scrambling to line up the best of the available capacity. Some already lined up:

National Acme Co. is subcontracting everything from single parts to complete machines to a cigar-cigarette machine company, a can machinery maker and a printing press builder. National Acme expects to get two machines per day—85 per cent completed on the outside—shipped back to its plant for special attachments and testing.

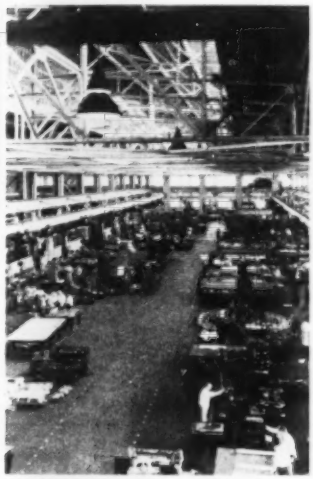
Gisholt Machine Co. has about 50,000 hours of work per month done on the outside on five types of complete machines. Between now and next September subcontractors will deliver 75 machines per month (average value: $20,000) to Gisholt.

Bullard Co., besides its award to GM's Fisher Body Division to build 757 42-inch vertical turret lathes, subcontracted production of its 34-inch four-spindle Type D vertical chucking machines to a refrigeration-air conditioner equipment company. Spacer tables are being built by a printing press company. Fisher Body, incidentally, is using Bullard suppliers wherever possible and has sub-

SUB ASSEMBLES WARNER & SWASEY SINGLE-SPINDLE CHUCKING MACHINE
. . . a sound knowledge of production peculiar to "tailor-making" of machinery

contracted parts from Maine to California.

Kearney & Trecker Corp.'s pool orders total $60 million; by midyear K & T hopes to have subcontractors doing 50 per cent of the machine hours required in production. Complete machines are being built by a shoe machinery company and a printing press maker that did substantial work for K & T about ten years ago. Large assemblies are also



PLANT 23 OF FISHER BODY
. . . Bullard assemblies to be built here

being built by a conveyor manufacturer and a graphic arts equipment producer.

Motch & Merryweather Machinery Co. started a subcontractor search last August. A textile machinery firm and a builder of gas engines got substantial orders from M & M.

New Britain Machine Co. has lined up 40 subcontractors so far, ten of them volume producers. Complete drilling machines are being built by an outfit that makes windlasses in normal times. Major portion of a special cartridge case machine that does head turning and trimming is being built by a newspaper machinery company.

Monarch Machine Tool Co. is having complete machining of castings done on the outside. Machine bases are being supplied too. Final assembly and inspection are done in Monarch's own shops. Much of the outside work is for 300 right angle air gage tracer machines for jet engine components.

Exclusive—Few concerns are qualified to take machine tool subcontracts. They can be roughly categorized into three groups. First are companies that can build an entire machine. Second are firms that can build complete components or subassemblies such as lathe headstocks, gears or chucks. Third is the "bits and pieces" group that operates as an outside department and furnishes certain parts needed on assembly lines.

Two-Way Street—Scope of operations that can be performed by a subcontractor is seen in the work schedule of Harris-Seybold Co., Cleveand, produce r of rotary printing presses and other graphic arts equipment which has started manufacture of a large quantity of machine tools —primarily for building aircraft.

Early this month the first Harris-built single-spindle automatic chucking machine was delivered by Harris to Warner & Swasey Co., Cleveland. Dies, jigs and fixtures for this job were supplied by W & S, who at the present time adds special attachments, and performs finishing operations and final testing in its own shop.

Announcing—Also in process now at Harris-Seybold plants are Pratt & Whitney four and eight spindle duplicating machines. The latter is a new machine developed by P & W for machining jet engine blade forgings. Harris contracted to produce these entire units.

Le Blond Machine Tool Co., Cincinnati, is having a major portion of precision assemblies for its dual-drive engine lathe—aprons, tailstocks, carriages, quick-change gear units—built at Harris-Seybold's plant in Dayton.

Tell Berna, general manager of NMTBA, says press manufacturers generally aren't as bad off as metal-cutting machine makers. In greatest demand, he says, are planers, vertical and horizontal boring mills, radial drills, turret lathes, and large cylindrical and surface grinders. Heavy hydraulic and big forging presses are in most demand in the press group. Production headaches are numerous. One company must furnish two-speed drill heads; aircraft companies using them are machining aluminum now, may switch to titanium later.

NPA Will Help—If you're looking for subcontract work, consider your qualifications before attempting to tackle the tool builders. NPA says: "If you don't belong in the machine tool picture, you'd be wasting your time trying to line up work." NPA and its field offices act as liaison between overloaded tool builders and companies with idle capacity. Field offices have made surveys of all ma-

SEARCHING around for a likely subcontractor for its single-spindle automatic chucking machines, Warner & Swasey picked Harris-Seybold, a printing press manufacturer with skilled workers in similar plant facilities, working with the same kind of raw materials to exacting tolerances

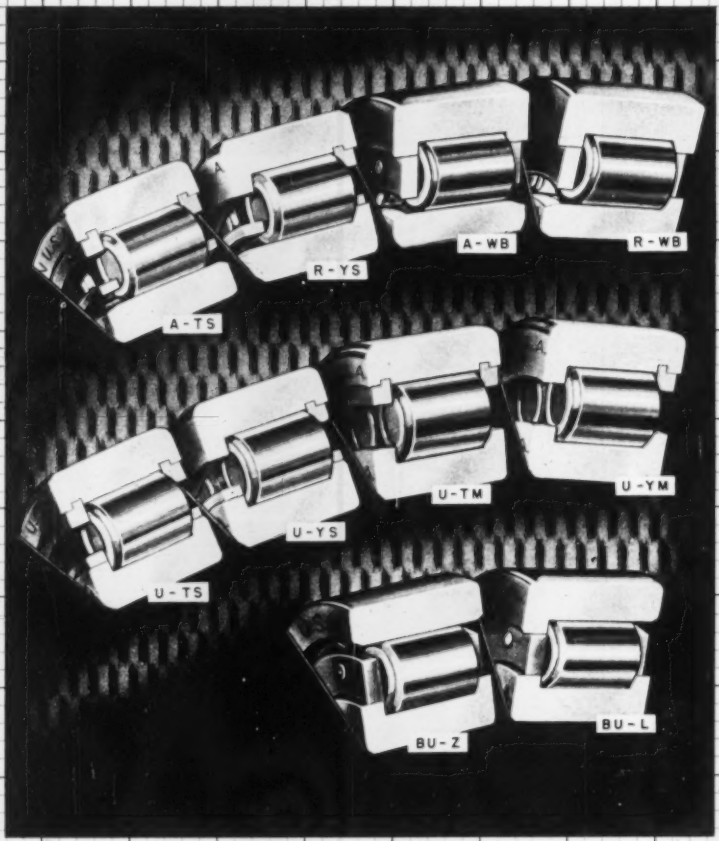
chine tools and other productive facilities in their areas. They can get parties together geographically (to save time and shipping costs) on "everything from small parts to complete machines." One field office helped place orders for gear trains, hardening and grinding and lathe machining involving as much as 5000 production manhours per week.

Wholehearted support from government is being given the tool program in other ways, too. OPS allows price increases—sometimes over double the toolbuilders cost—to be added to manufacturing cost of machines subcontracted. General Services Administration says subs building machine tools can qualify for working capital V-loans.

May be—An "aids to manufacture" clause in government contracts is now under consideration. It would allow the builder to borrow money needed for duplicate jigs, fixtures, special gages, patterns, etc., not of permanent value to him. (One monumental task the machine tool industry is faced with is supplying jigs and fixtures needed in outside shops.) Loans on jigs and fixtures would be amortized over the machines produced by a subcontractor or over his production in a certain period of time.

Also in the works are limitations orders to conserve both manpower and materials. One would eliminate complete filling and sanding of castings and reduce the number of coats of paint to be applied. Another would provide for standardized wiring of electrical components to simplify ordering of these parts.

Mutual—By subcontracting, tool builders acquire a whole new set of muscles for their rigorous task ahead. Value of subcontracting to mobilization is obvious. Both principals benefit greatly too: The tool bulider expands his shop without a brick being laid and the sub's highly skilled production, development and management team won't disintegrate during the emergency.



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HYATT ROLLER BEARINGS

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

At its 1952 model display, Chrysler shows how it's coping with shortages and government restrictions on materials. The radiator gets the most attention

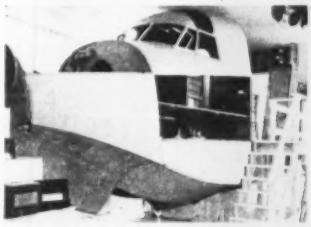
DETROIT

SOME INSIGHT into the multitudinous problems which have been raised for automakers by government restrictions and materials shortages was offered by Chrysler Corp. at an engineering department exhibit held in conjunction with its 1952 product display (STEEL, Nov. 12, p. 61).

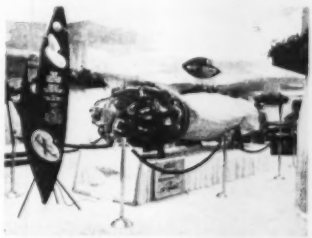
Granted that many more engineering difficulties have arisen than could be graphically depicted, those which were highlighted nevertheless give a nutshell account of some of the worst of the year's problems and their solutions. Probably the item currently undergoing the most thorough investigation automotivewise is the radiator, and some of the experiments which Chrysler engineers have worked on are interesting, though inconclusive at the moment.

Just a Hope—Hope throughout the industry—and the government—is that an all-aluminum radiator can be developed. Chrysler had one on display which had racked up over 16,000 miles of operation with no difficulty, but assembly in production is a problem for which they still have found no satisfactory answer. Also the problem of effects of alkalinity of water in various parts of the country still has them stumped.

For the time being the corporation is coping as best it can with the copper shortage by reducing the gage of copper and brass in the radiator tanks and core. In six-cylinder engine cars the new design takes 23 per cent less copper than formerly, this being achieved, the engineers claim, with no noticeable shortening of the unit's life. Almost four radiators can be built with the material formerly used for three. Gage of the tank has been reduced in thickness 0.005-inch. To compensate for the thinner walls the tank has been redesigned to provide rounded corners to minimize the chance for crackage developing as the tank "breathes." To prevent the chance for rupture where the hose connects to the tank, a disc acting as a stiffener and spreading the strain over a wider area has been added. The brass water course in the core has been reduced from 0.0046 inch thickness to 0.0040, and the copper spacers which transfer the heat from the water to the air have been reduced from 0.0035 inch to 0.0025 inch in thickness. Undergoing tests also are tanks of steel with copper cladding, but the raw edges of these are subject to rusting, and some porosity in the copper cladding has been noticed.

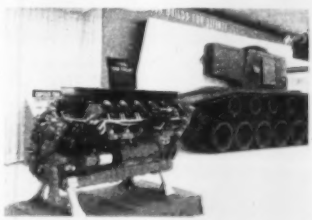


GRUMMAN ALBATROSS PLANE HULLS
. . . to be made by Plymouth at Evansville



J-48 JET ENGINES
. . . scheduled for Dodge at Detroit

FOUR-BLADED HAMILTON PROPS
. . . will be built by Dodge-San Leandro



V-12 AIR-COOLED TANK ENGINES
. . . to come from Chrysler at New Orleans

One Leads to Another—A chain reaction was set off when the engineers began looking into the redesign possibilities of the platform on which the battery sits. In previous design an aluminum stamping, to which was attached, by a brass grommet, a rubber hose to drain off any spilled water or electrolyte, was used. That has been replaced by a plastic tray, and the hose and grommet assembly was replaced by a vinyl plastic tube in which was molded a circular slot in which the tray is seated merely by pulling the tube through. Several machine assembly operations, not to mention critical materials, are thereby saved.

On the stop light wiring a similar redesign was effected. In this case the wiring had been enclosed in a neoprene tube which was prevented from sliding and given mooring for attachment to the car body by two brass grommets. Using molded vinyl again, the engineers were able to eliminate assembly operations and make installation simply a matter of pulling the unit through the body holes where it seated itself in the integrally molded slots.

Byproduct Benefits—A zinc die cast ash tray gave way to molded plastic, a better fit and freedom from rattle being claimed as an incidental result. The water pump impeller, formerly cast iron pinfastened to its shaft, now is mold-

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Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,879
February	658,918	505,593
March	802,737	610,680
April	680,281	585,705
May	695,898	732,161
June	653,682	897,853
Six Mos.	4,137,204	3,941,878
July	522,858	746,801
August	571,442	842,335
September	505,758	760,847
October	548,350*	796,010
November		833,784
December		671,622

Week Ended	1951	1950
Oct. 20	120,810	188,323
Oct. 27	121,215	189,230
Nov. 3	118,743	177,122
Nov. 10	120,483	161,038
Nov. 17	115,000*	122,498

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Where Weight Can Go in Cars

Some of the little-suspected places where an important part of a car's weight is contained were described by Robert Anderson of the Chrysler chief body engineer's staff at the recent technical convention in Detroit of the American Society of Body Engineers.

"It is seldom that many pounds can be taken out of a particular part, but a close analysis will often indicate savings of ounces on detailed parts which will add up to many pounds for the entire body," he says. His example: A body having a surface area of around 100 square feet can have eight pounds lopped off its weight by reducing the thickness of the steel skin by .001 inch. Savings of this nature may be puny, however compared with the opportunities in interior trim, seating and sound deadening material. "A large percentage of the total body weight is contained in the interior trim items," he said, adding "I believe it is in these items that the body engineer will find his most fertile field for future reductions in cost and weight."

Trend away from conventional seat construction and toward new designs which incorporate substantial cost and weight saving (see below), he noted, is just gathering momentum and we will undoubtedly see even greater advances in the future."

Sound deadener in a body accounts for 10 to 20 per cent of its total weight. There may be as much as 30 to 40 pounds of sprayed-on deadener in a body.

Young Introduces Seat Assembly

A coil spring maker's answer to the inroads which have been made by the so-called zig-zag seat springs is now in production.

L. A. Young Spring & Wire Corp., Detroit, exhibited at the Body Engineers Convention its new coil spring seating assembly and announced that this unit is going to appear in 1952 models of one of the largest independent car manufacturers. Described in some detail and pictured in STEEL, Dec. 25, 1950, p. 90, the unit includes the complete front seat and back and combines a tubular framework and masonite panels to which are stapled the coil springs. The body assembler needs add only padding and upholstery and attach the unit to the floor.

Claimed for the unit is greater strength and lighter weight. It is understood to cost less than the zig-zag spring or conventional coil spring assemblies. Savings of more than 25 per cent in steel use in the assembly are obtained by the masonite foundation panels. Additionally the unit eliminates the need for burlap with which coil springs have been covered in the past and which has been extremely difficult to obtain. Instead of this material as a sound deadener, L. A. Young's unit is completely covered with a plushy surface of rayon particles known as "flocking" which not only sound-proofs the unit but also act as a rust preventive.

Because the framework is of tubing instead of stampings from which conventional cushion and back frames are made, L. A. Young has gone into steel tubing manufacture and is adding 100,000 square feet of manufacturing space to its Chicago plant to gain the needed production space. First installation of the new type seat, it is suspected, will be in new Nash Statesman and Ambassador models when they appear early next year. Incorporated in the design of the seat is provision for converting the seat into a bed.

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153

ed plastic press-fitted in position. Plastic parts, on which a conductive lacquer has been sprayed and then plated in the conventional copper-nickel-chrome sequence, are being used now for short-run items but may appear as some interior items of hardware in production models next year.

The only major metal whose use is not restricted by government controls—magnesium—was to be seen in many experimental applications around the displays, and Chrysler claims to be the foremost user of automotive magnesium castings. Units such as torque converter housings, carburetor die castings, and main members of convertible top support arms were of the light metal, the latter application having become standard among most manufacturers in the last year.

Changing Changes — Substitutions which have been made in steel analysis to avoid unnecessary alloy usage are numerous. A pinion and ring gear, for example, in less than two years' time has undergone six analysis changes. Up to February, 1950, SAE 4815 had been specified. At that time SAE 4620 was released for production. By November the 1.8 per cent nickel content of that steel was too rich and SAE 4032 containing no nickel was specified. In March, 1951, SAE 8620 was "it" for a month, being replaced in April with SAE TS8620 with a higher chromium and lower molybdenum content. In June the parts went to SAE 6120 with a still higher chrome content and .12 per cent vanadium replacing the nickel and moly.

The auto metallurgists are not yet finished: Three steels—SAE 5120, 81B20, and 50B20 are undergoing tests in this application and listed "for future development" is 14B20, the boron-treated alloyless steel.

Emphasis in automobile design and manufacture is increasingly in the direction of weight saving. This has manifested itself in the experiments with aluminum alloy engines, with aluminum bodies and magnesium parts and framing. It reveals itself in the Henry J, Nash Rambler and soon the Willys "Aero" series of passenger cars will show it, also.

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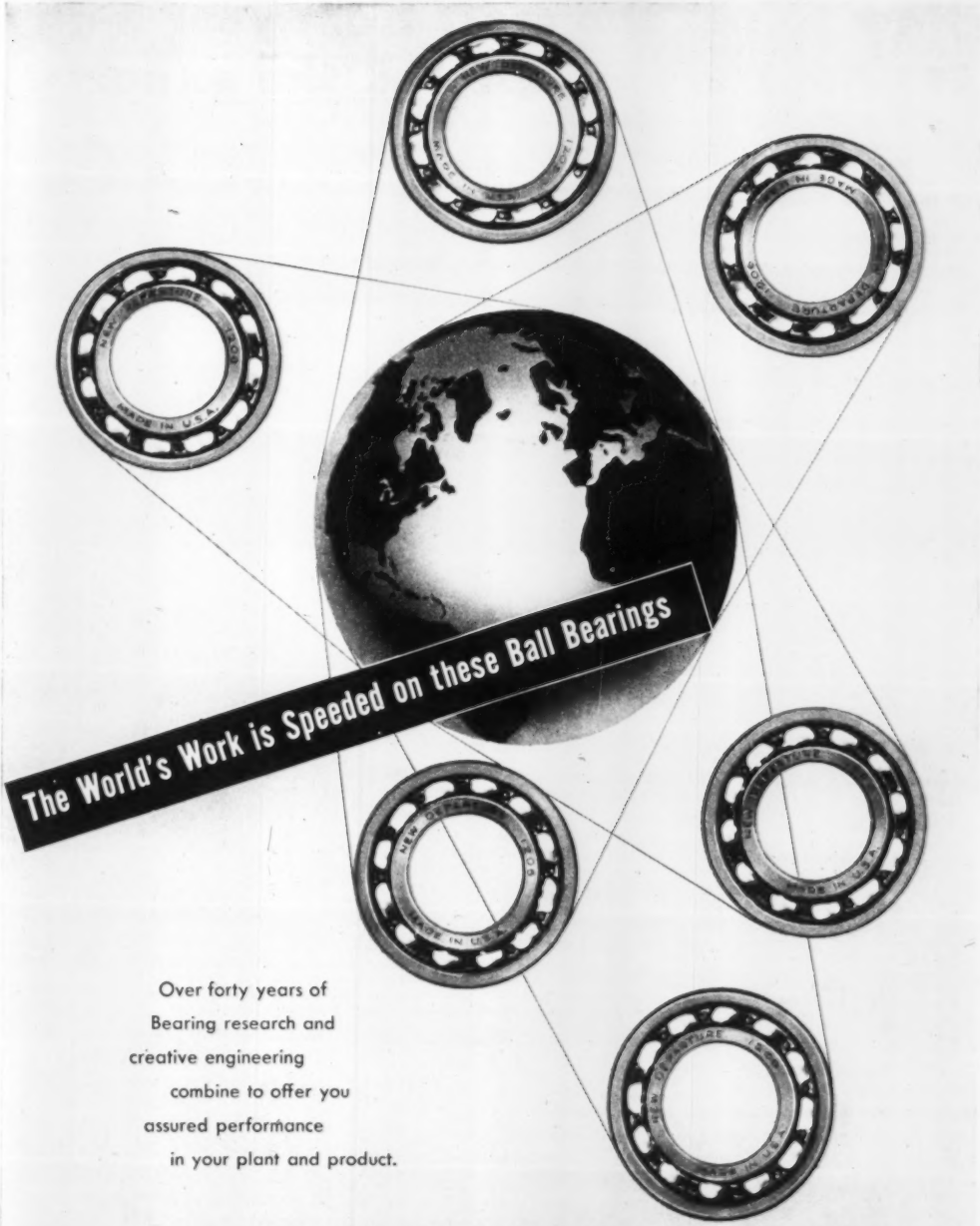
Claimed for the unit is greater strength and lighter weight. It is understood to cost less than the zig-zag spring or conventional coil spring assemblies. Savings of more than 25 per cent in steel use in the assembly are obtained by the masonite foundation panels. Additionally the unit eliminates the need for burlap with which coil springs have been covered in the past and which has been extremely difficult to obtain. Instead of this material as a sound deadener, L. A. Young's unit is completely covered with a plushy surface of rayon particles known as "flocking" which not only sound-proof the unit but also act as a rust preventive.

Because the framework is of tubing instead of stampings from which conventional cushion and back frames are made, L. A. Young has gone into steel tubing manufacture and is adding 100,000 square feet of manufacturing space to its Chicago plant to gain the needed production space. First installation of the new type seat, it is suspected, will be in new Nash Statesman and Ambassador models when they appear early next year. Incorporated in the design of the seat is provision for converting the seat into a bed.



Over forty years of
Bearing research and
creative engineering
combine to offer you
assured performance
in your plant and product.

Nothing Rolls Like a Ball...

NEW DEPARTURE

BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

153

How to get the most from your high temperature tubes: Ask the experts!

CHANCES are you can find several high temperature steels that will solve your heat, pressure, corrosion and oxidation problems. But there's only *one* steel that will give you maximum tube life per dollar —the best life/cost ratio.

The Timken Company metallurgists—the recognized authorities on high temperature steels—can help you find that one steel. With a background of 20 years of steel development and with 23 different analyses at their disposal—plus wide field experience—they are qualified to help you choose the correct analysis for your application. And whatever analysis is recommended, you can be sure of uniform quality because the Timken Company carefully controls quality from melt shop through final inspection.

Our "RSQ"—Research, Supply, Quality —can solve your tube problems. *Ask the experts!* The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

The Timken Company pioneered in testing high temperature steels. Hot twist apparatus shown here is used to evaluate the hot working characteristics of high temperature steels.

This month's report is on: **4-6% CR.-MO.**

Suggested for applications where high creep resistance is not required, but where good stability, corrosion and oxidation resistance are essential. For cracking furnace tubes, heat exchangers, super-heaters, air heating equipment and forgings and other parts exposed to oxidation or oil corrosion.

23 TIMKEN STEELS FOR HIGH TEMPERATURE SERVICE

Carbon	Sicromo 2	Sicromo 5S	16-13-3
Carbon-Mo.	Sicromo 2½	Sicromo 5MS	25-20
DM-2	2¼% Cr.-1% Mo.	Sicromo 7	25-12
Silmo	Sicromo 3	Sicromo 9M	35-15*
DM	4-6% Cr.-Mo.	18-8 Stainless	16-25-6*
2% Cr.-Mo.	4-6% Cr.-Mo.-Ti.	18-8 Cb	

**Not available as seamless tubing at the present time.*

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

TIMKEN

TRADE-MARK REG. U.S. PAT. OFF.

Fine Alloy

STEEL

and Seamless Tubes

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing

The Business Trend

Assurance of continued business stability is given by steady industrial production, large volume of unplaced arms orders, lower inventories and quickening trade tempo

STREAM of business is flowing along smoothly enough through the channels of mobilization.

The course ahead, which will be affected to a great degree by international developments, was brought into sharper focus by Budget Bureau estimates of future federal spending. Congress authorized $89.6 billion for defense in fiscal 1952, $5 billion more than appropriations for this purpose in fiscal 1951. Of this two-year total of $174 billion, nearly $100 billion remains to be spent. The biggest part of the arms load has yet to be thrown into industry's lap.

Best laid production plans could go awry if major strikes develop around the turn of the year. A prolonged steel strike particularly would set back the arms program decidedly and break the backs of many civilian industries whose steel rations already are meager.

Industrial production has been above year-ago levels for two weeks now. STEEL's industrial production index for the week ended Nov. 10 measured 216 per cent of the 1936-1939 average, a one-point drop from the preceding week. A year ago the index registered 214. Lowered rate of steelworks operations in the latest index was offset partially by sky-high electric power output. Producers of electric power generating equipment may win their campaign for higher materials allotments by merely pointing to recent drains on their facilities.

Steel Torrent Unabated . . .

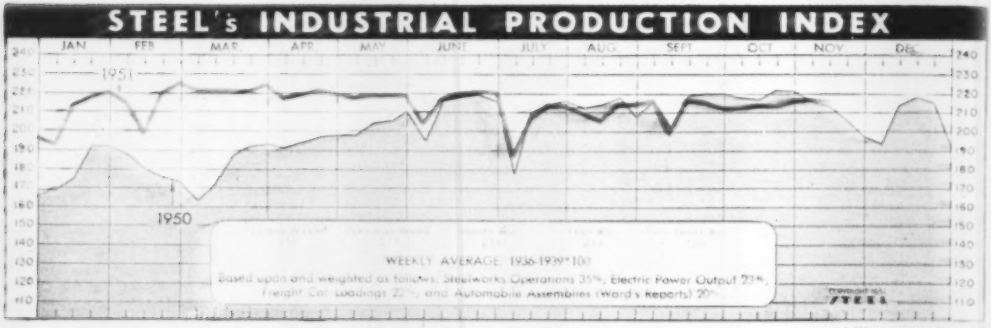
Strenuous efforts of the steel industry in October are seen in production figures showing the largest tonnage ever made in one month. For the first ten months of 1951, 87,435,639 tons of steel for ingots and castings have been turned out, almost 7 million tons more than were poured in the same period last year. On a weekly basis, the industry was scheduled to operate above capacity again in the week ended Nov. 17. Output was pegged at 2,021,000 net tons in that period by American Iron & Steel Institute. Arrival of freezing weather at upper lake loading docks early this year will prevent shipments from reaching 90 million tons as was expected earlier. With some of this ore lost and scrap drives lagging, there may be acute shortages in the steel mills this winter.

Auto Assemblies Steady . . .

Winter weather, model changeovers and supplier strikes hindered auto production in the week ended Nov. 10, but total output crept up a little from the previous week. Total U. S. and Canadian assemblies amounted to 120,483 cars and trucks, says *Ward's Automotive Reports*. U. S. production showed the emphasis being given to truck production —up 9 per cent so far this year. Assembled in the latest week were 87,000 passenger cars and 25,000 trucks. Controlling factor in weekly production for the balance of November will be model changeovers, says *Ward's*. This week will see another "long holiday" at many auto plants:

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	101.5	104.0	101.5	103.0
	Electric Power Distributed (million kilowatt hours)	7,290	7,319	7,160	6,574
	Bituminous Coal Production (daily av.—1000 tons)	1,885	1,922	1,181	1,922
	Petroleum Production (daily av.—1000 bbl)	6,310	6,288	6,329	5,911
	Construction Volume (ENR—Unit $1,000,000)	$159.5	$209.8	$220.7	$101.9
	Automobile and Truck Output (Ward's—number units)	120,483	118,743	120,543	161,038
	*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.				
TRADE	Freight Car Loadings (Unit—1000 cars)	860†	838	869	840
	Business Failures (Dun & Bradstreet, number)	150	143	126	135
	Currency in Circulation (in millions of dollars)‡	$28,534	$28,410	$28,448	$27,388
	Department Store Sales (changes from like wk. a yr. ago)‡	+11%	+5%	−2%	−6%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$15,165	$16,409	$14,856	$13,318
	Federal Gross Debt (billions)	$257.9	$258.3	$257.0	$256.7
	Bond Volume, NYSE (millions)	$10.5	$12.1	$12.4	$16.0
	Stocks Sales, NYSE (thousands of shares)	6,041	8,142	7,445	7,827
	Loans and Investments (billions)†	$72.6	$72.6	$71.2	$69.2
	United States Gov't. Obligations Held (millions)†	$31,926	$31,940	$30,878	$33,535
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	171.92	171.92	171.92	157.76
	STEEL's Nonferrous Metal Price Index‡	234.9	234.9	234.9	244.9
	All Commodities†	177.2	177.0	177.4	170.4
	Metals and Metal Products†	190.9	190.9	190.9	180.7
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				



* Week ended Nov. 10

Fewer Goods on Shelves . . .

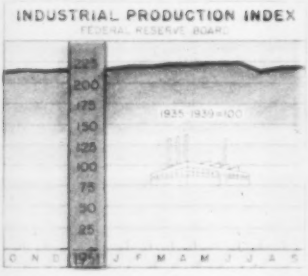
Total business inventories dipped for the second consecutive month in September, says Office of Business Economics. Going into October, total inventories were valued at $69.6 billion. After allowance for seasonal variation, they dropped about $250 million in the month. Manufacturers' inventories rose about $300 million, but were more than offset by a decline of $600 million in retailers' stocks. Wholesalers had the same amount of goods on hand at the beginning of October as they had a month earlier. Manufacturers' stocks of durable goods shipped $400 million and their stocks of nondurables increased $100 million on a seasonally adjusted basis.

Freight Car Goal Reached . . .

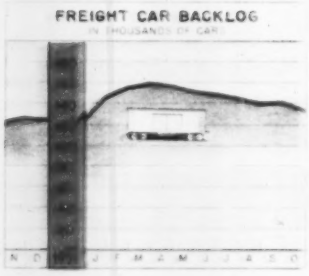
Freight car builders in October reached their 10,000-car-a-month goal for the first time since April, 1948. American Railway Car Institute and Association of American Railroads announced. Production totaled 10,082 cars, an increase of 150 per cent over June, 1950. First quarter steel allocations to the industry will "forc[illegible] cutbacks of about 3000 cars per month, according to present estimates. Orders for 3461 new freight cars were received in October, leaving backlog of 132,792.

850,000 Homes in '52 . . .

Construction's dollar volume will run 10 per cent less in 1952, says F. W. Dodge Corp., construction news and marketing specialist. Fourth quarter dip in contract volume will carry over into 1952, perhaps through the middle of the year or until the metals situation improves and materials controls are eased. Residential building will decline about 16 per



Industrial Production Index

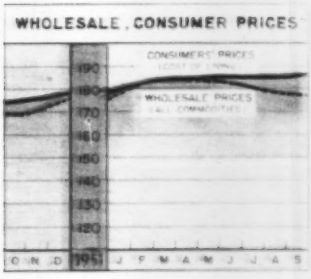


Freight Car Awards and Backlog

	Awards		Backlogs	
	1951	1950	1951	1950
Jan.	20,228	1,320	141,726	19,020
Feb.	11,446	2,466	136,864	20,655
Mar.	11,223	3,240	126,831	30,600
Apr.	6,042	10,440	120,821	32,850
May	11,062	11,062	120,862	42,300
June	5,466	14,172	116,258	46,086
July	21,206	14,316	116,948	67,086
Aug.	22,500	15,000	120,610	85,536
Sept.	25,152	14,328	140,126	106,911
Oct.	21,366	132,760	132,792	125,144
Nov.			120,870	126,870
Dec.			120,480	121,680

End of month

Association of American Railroads, Car Service Division, and American Railway Car Institute



Price Indexes

	Wholesale (1926=100)		Consumer (1935-39=100)	
	1951	1950	1951	1950
Jan.	190.1	153.2	181.5	168.2
Feb.	190.9	155.1	180.9	167.9
Mar.	191.0	156.7	180.7	168.4
Apr.	190.4	157.6	181.4	168.3
May	192.3	159.0	181.5	168.2
June	191.7	157.0	180.2	170.2
July	179.1	162.5	180.3	170.6
Aug.	175.1	166.0	180.1	171.4
Sept.	175.4	169.0	180.4	174.8
Oct.		169.1		175.6
Nov.		173.5		176.6
Dec.		175.0		176.8

U. S. Bureau of Labor Statistics

Charts Copyright 1951 Steel

cent in 1952 to a total of about 850,000 new houses. Nonresidential building is expected to fall 6 per cent; public and private works and utilities construction are expected to dip 4 per cent. Privately owned utilities are marked for a 31 per cent gain.

Prices Near Status Quo . . .

Average wholesale prices have been relatively stable in recent weeks. In the week ended Nov. 6 they advanced slightly to 177.2 per cent of the 1926 average. At that point the Bureau of Labor Statistics index is 12.9 per cent above the pre-Korean average and 4 per cent higher than a year ago.

Appliance Tempo Quickens . . .

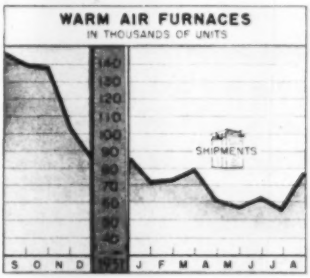
Appliance production is on the upgrade again. September figures show most types of electric appliances were turned out at faster pace than August. Jump in production is a good indication of the faith producers have that their market is returning. Most spectacular output gain was made in household electric ranges. Factory sales jumped from 64,874 units in August to 96,182 units in September. Electric refrigerators showed a gain from 187,603 to 215,459 units in those months. Slight declines were noted in electric water heaters and freezers. Nearly all electric housewares showed gains.

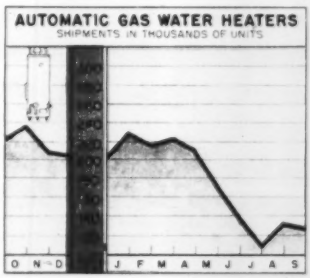
Trends Fore and Aft . . .

Federal Reserve Board is reweighting its index of industrial production . . .Personal income in September was at an annual rate of $253.3 billion, virtually unchanged from August. . .Department store sales are now running about 10 per cent higher than last year, and for 1951 to date are approximately 4 per cent higher than the same period of 1950 . . .About 15 per cent of the average American's disposable income is used to pay off contracted debts. . .Industrial construction awards nose-dived to $29 million in the week ended Nov. 8 from $76 million in the preceding week. . .11,310,000 net tons of bituminous coal were mined in the week ended Nov. 3.

Issue Dates of other FACTS and FIGURES Published by STEEL:

Construction Oct.29	Gray Iron Castings..Oct.22	Ranges, Gas Oct.29
Durable Goods Oct.8	Ironers Nov.5	Refrigerators Oct.1
Employ., Metalwkg. Nov.12	Machine Tools Nov.5	Steel Castings Oct.22
Employ., Steel Oct.29	Malleable Castings..Oct.22	Steel Forgings Aug.20
Fab. Struc. Steel ..Nov.12	Pumps, New Orders.July9	Steel Shipments ...Nov.5
Foundry Equip. ...Nov.12	Purchasing Power ..Oct.8	Vacuum Cleaners ...Oct.29
Furnaces, Indus. ..Nov.12	Radio, TV Nov.12	Wages, Metalwkg. ..Oct.22
Gear Sales Nov.5	Ranges, Elec. Oct.29	Washers Nov.5





Warm Air Furnaces
Shipments in Units

	1951	1950	1949
Jan.	71,143	39,887	31,734
Feb.	71,966	45,618	33,011
Mar.	79,239	59,982	51,271
Apr.	60,337	58,798	34,471
May	56,282	78,349	42,406
June	61,889	98,517	55,916
July	55,045	102,189	48,575
Aug.	77,192	145,512	85,320
Sept.	.....	139,014	112,264
Oct.	.....	137,915	103,401
Nov.	.....	102,001	79,280
Dec.	.....	85,407	52,323
Total	.....	1,093,189	719,972

U. S. Bureau of the Census

Automatic Gas Water Heaters
Shipments in Units

	1951	1950	1949
Jan.	225,600	131,600	88,400
Feb.	213,400	156,500	84,500
Mar.	223,300	172,800	106,000
Apr.	199,400	176,400	115,200
May	167,400	195,200	120,200
June	131,500	207,100	132,200
July	102,400	197,500	114,400
Aug.	132,300	259,800	138,800
Sept.	127,100	222,600	147,300
Oct.	.....	235,100	154,200
Nov.	.....	206,000	138,300
Dec.	.....	202,500	126,500
Total	.....	2,363,100	1,466,000

Gas Appliance Mfrs. Assoc.

VAPOR
stops rust
FOR STUDEBAKER

GONE BY the board at South Bend is the habit of applying oil or grease to exported body parts.

NOW, Studebaker simply lines crates with a paper — Angier VPI* Wrap. It gives off a vapor that stops rust!

SAVED at receiving points are "cleaning costs." Saved at the home plant is packaging time. And . . . more space is found for production because bulky dip and spray equipment became obsolete.

EIGHT other auto makers have revolutionized their way of packaging. So have hundreds of other VPI users who ship or store tiny hair springs . . . 34,000 lb. engines . . . airplane parts.

IF YOU have a stake in metal products or parts you'll find "VPI Applications" worth reviewing.

Write, Angier Corporation, Framingham, Mass.

Most experienced name in vapor rust preventives.

Distributors in principal cities.

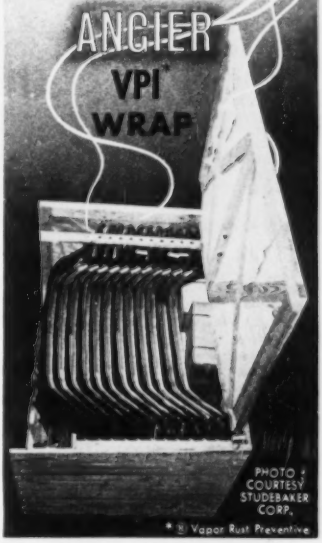


PHOTO COURTESY STUDEBAKER CORP.

* Vapor Rust Preventive

Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY

made MIGHTIER through the competence of INTEGRATED PROCESS CONTROL

The quality of the Ohio Rolls you buy is assured by our method of INTEGRATED PROCESS CONTROL. The combined talent of one group of metallurgists, chemists, engineers and inspectors is responsible for maintaining uniform quality. They direct your order from start to finish. If you would like a booklet explaining it in detail, write us today.

Select from any of these eleven types of Ohio Steel and Iron Rolls:
Carbon Steel Rolls
Ohioloy Rolls
Ohioloy "K" Rolls
Holl-O-Cast Rolls
Chilled Iron Rolls
Denso Iron Rolls
Nickel Grain Rolls
Special Iron Rolls
Nioloy Rolls
Flintuff Rolls
Alloy Chilled Iron Rolls

THE OHIO STEEL FOUNDRY CO. LIMA, OHIO

PLANTS AT LIMA AND SPRINGFIELD, OHIO

Men of Industry

W. TAYLOR-BAILEY
. . . new president of Dominion Bridge

HAROLD W. BEDER JR.
. . . Whitney Chain gen. sales mgr.

WILLIAM M. BLACK
. . . heads Electro-Alloys Division

Dominion Bridge Co. Ltd., Lachine, Que., elected **W. Taylor-Bailey** president and managing director. He is succeeded as vice president and general manager by **A. H. Cowie,** formerly manager, eastern division. Mr. Taylor-Bailey succeeds the late **W. F. Angus.**

William A. Cook, formerly general sales manager, was appointed vice president in charge of sales, **Central Iron & Steel Co.,** Harrisburg, Pa., and **Phoenix Iron & Steel Co.,** Phoenixville, Pa., subsidiaries of Barium Steel Corp., New York. **John Milos** was appointed vice president and general manager of Phoenix Iron & Steel.

Don Bussey was named plant superintendent at **Kaiser Aluminum & Chemical Corp.'s** Moss Landing, Calif., refractory brick plant. He replaces **Doug Wilkins,** transferred to Permanente, Calif., as assistant to **J. F. Knight,** works manager of chemical operations in California.

William H. Myers was named general district superintendent in charge of six plants of **Harbison-Walker Refractories Co.,** Pittsburgh. **J. H. Moore Jr.** was appointed general district superintendent in charge of coke oven manufacture; **Charles W. Ayers,** superintendent of the company's new Windham, O., silica plant; and **William N. Bartleson,** superintendent of the newly acquired plant at Warm Springs, Calif.

Feedrail Corp., New York, elected **R. E. Nugent** chief engineer; **W. R. Jewett,** assistant chief engineer; **W. J. Bulanchuk,** design engineer; and **G. H. Baumann,** sales manager.

Harold W. Beder Jr. was appointed general sales manager, **Whitney Chain Co.,** Hartford, Conn. He was formerly a market research specialist with McKinsey Co.

James A. Sharkey was elected executive vice president, **Milford Rivet & Machine Co.,** Milford, Conn. He is replaced as vice president-sales by **Vincent L. Bradford. Robert M. Gordon,** New England division sales manager, becomes assistant general sales manager, covering all products and divisions, and is succeeded in New England by **John Boras.**

Roger A. Kenman was named sales manager of the machine tool division of **Charles H. Besly & Co.,** Beloit, Wis.

A. J. Mallinckrodt was appointed chief engineer, **United States Air Conditioning Corp.,** Minneapolis. He formerly was manager of engineering for Baker Refrigeration Corp.

Lithium Co., Newark, N. J., manufacturer of industrial furnaces and lithium atmosphere and other gas generators, promoted **Frank A. Rusciano** to vice president-works manager. He was chief engineer.

York Corp., York, Pa., elected **Donald M. Magor** vice president-controller, and **William F. Lynne,** secretary-treasurer.

Edward L. Dull was named Detroit district sales manager for **Mercer Tube & Mfg. Co.** He also will represent three associate companies—Sawhill Mfg. Co., Shenango Tube Co. and Agaloy Tubing Co.

William M. Black was appointed president, and **Joseph L. Mullin,** vice president of Electro-Alloys Division, **American Brake Shoe Co. Walter G. Hoffman,** former president of the division, was appointed assistant to the vice president for research and development of American Brake Shoe and is assigned to special metallurgical development projects at the company's research center in Mahwah, N. J. Mr. Black, a vice president of American Brake Shoe, is also president of the American Manganese Steel Division, of which Mr. Mullin continues as vice president in charge of operations.

Morse Chain Co., Chicago, subsidiary of Borg-Warner Corp., appointed **Louis P. Smith** manager of its Ithaca, N. Y., plant. He was vice president-manufacturing, French & Hecht Division, Kelsey-Hayes Wheel Co.

Charles T. Lewis was named chief lubrication engineer, **Republic Steel Corp.,** Cleveland. He is succeeded as lubrication engineer at Warren, O., by **William E. Schnitgen.**

Republic Steel Corp., Cleveland, appointed **Eugene W. Phillips** manager of construction of the company's seamless tube installation project in the Chicago district. During Mr. Phillip's Chicago assignment **Oscar M. Schulze** will serve as acting chief engineer of Republic's central alloy district.

K. Jerry Morray of **General Electric Co.'s** chemical division, was transferred to the silicone plant at Waterford, N. Y., as a headquarters sales specialist. He was a silicone sales representative in the Cleveland area, and

is succeeded by **Milton C. Lauenstein Jr.**

Samuel W. Gibb was appointed vice president in charge of sales, **G & D**

SAMUEL W. GIBB
. . . V. P. sales, C&D Batteries Inc.

Batteries Inc., Conshohocken, Pa. He formerly was general sales manager, Yale & Towne Mfg. Co., and more recently, under his own name, an agent for materials-handling equipment in California.

H. E. Robertson was appointed comptroller of **Quaker Rubber Corp.,** division of H. K. Porter Inc., Philadelphia.

John B. Owen was promoted to general manager of sales, **Edgcomb Steel Co.,** Philadelphia.

H. M. Griffith was appointed assistant to the president of **Steel Co. of Canada Ltd. M. A. Leishman** was made works manager of the company at the Hamilton and Ontario Works; **G. W. Bruce,** assistant works manager; and **A. D. Fisher,** general superintendent. Mr. Griffith succeeds **R. M. Kelday,** recently named manager, wire, wire products and screw division, with headquarters at Canada Works.

Assignments in the defense products group of **Westinghouse Electric Corp.,** Pittsburgh, include: **L. E. Osborne,** executive vice president-defense products; **W. B. Anderson,** assistant to Mr. Osborne; **F. L. Snyder,** manager, aviation gas turbine division; **R. C. Bergvall,** manager, engineering; **B. M. Brown,** sales manager; and **M. A. Dotterer,** manager of production. Succeeding Mr. Osborne as vice president of manufacturing for the company is **Tom Turner,** who also continues as vice president-labor relations.

Willoughby F. Brazeau resigned as president of Intsel Metals Corp. and International Selling Corp. to join **W. R. Grace & Co.,** New York, in its ore and metal department.

J. Kent Burton was made manager of manufacturing, electronic tube division, **Westinghouse Electric Corp.,** Elmira, N. Y.

Roy W. Brown was appointed southwest direct sales representative for **Carborundum Co.'s** refractories division, Perth Amboy, N. J.

R. A. Metcalf was appointed sales manager, **Miller Electric Mfg. Co.,** Appleton, Wis., and **C. Burnell Abel** was elected vice president-sales.

Earl Bigam Jr. was appointed Cleveland sales representative of **Solar Steel Corp.**

William R. Meikle was named plant manager, Middletown, Pa., **National**

WILLIAM R. MEIKLE
. . . National Radiator plant mgr.

Radiator Co. He recently joined the company to handle heavy steel defense production at this plant.

American Car & Foundry Co., appointed **Joseph T. McNally** New York district sales office agent to specialize in tank car and miscellaneous sales.

Hartford Special Machinery Co. appointed **Anthony F. Ward** exclusive representative in the New England area for its line of automatic drilling and tapping machinery. He has an office at East Providence, R. I.

E. B. Snarey was appointed Cleveland district manager, **Braeburn Alloy Steel Corp.**

Marcus E. Borinstein resigned as vice president in charge of merchandising, as western division manager, and as a member of the board of directors of **James Flett Organization Inc.,** Chicago, with which he has been associated for the last six and a half years.

Frank W. Davis was appointed assistant chief engineer-research and development by **Consolidated Vultee Aircraft Corp.,** San Diego, Calif. **R. J. Dillon** becomes manager of a newly formed expediting department of the company.

Stewart-Warner Corp. appointed **Ray F. DeVaney** domestic heating equipment sales manager, South Wind Division. He succeeds **H. W. Milner,** resigned, and will have headquarters in Indianapolis.

J. G. Wells Jr. was appointed sales manager, **Lobdell United Co.,** Wilmington, Del., subsidiary of United Engineering & Foundry Co.

Glenn A. Duis was elected president of **Anthony Co.,** Streator, Ill., and **William C. Anthony** becomes board chairman.

Canada Iron Foundries Ltd., Montreal, Canada, elected **W. J. Langston** chairman of the board, and **T. F. Rahilly,** president. Mr. Langston has been president and general manager of the company since 1942. Mr. Rahilly has been president and general manager, Toronto IronWorks Ltd., since 1946.

W. A. Brown Jr. was elected president and general manager, **Liquid Carbonic Corp.,** Chicago. He was vice president and general manager, and as president succeeds **P. F. Lavedan,** who was elected to the newly created

W. A. BROWN JR.
. . . elected president, Liquid Carbonic

office of chairman of the board, in which capacity he continues as chief executive officer. **K. P. Miller** and **J. P. Wright** were elected vice presidents. Mr. Miller is in charge of ma-

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A.I.S.I.—C-1008, MT-1010, MT-1015, C-1118, MT-1020, C-1025, C-1035, E-1095

Alloy Steels:
A.I.S.I.—4130, 4132, 4140, 4150, 8630, E-52100

Stainless Steels:
A.I.S.I.—303, 304, 305, 309, 310, 316, 317, 321, 347, 403, 410, 420, 430, 446, T-5

Nickel Alloys:
Nickel, "D Nickel"*, "L Nickel"*, "Monel"*, "K Monel"*, "Inconel"*, 30% Cupro Nickel, 18% Nickel Silver.

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The HOLE Story —by— Superior

Chapter 2

The Bubble That Beats Trouble to the Punch

In science, the arts and industry, fine small tubing serves many purposes, from the hypodermic injection of healing drugs to the control of hydraulic presses that produce airplane and tank components.

In every tubing job there is one prime requirement. The tube must not leak. Here at Superior we specialize in the production of high quality tubing in all practical metals . . . and we use many methods to insure the superiority of our product.

Precision gauges in the hands of experienced inspectors check for dimensional precision. High powered microscopes in our laboratories investigate grain structure. Chemical analysis maintains close control on metallurgy. And in our shops compressed air, under pressures to hundreds of pounds per square inch, is forced into tubing held under water to make sure that leaks are detected and eliminated.

The whole story of Superior is one of quality . . . in machines and methods, in men, and in the end result —fine small tubing to do tough jobs well.

This is a story with continuity, for our aim holds always to raise the standards by which we judge Superior tubing . . . and to continue to increase the rate at which we produce it to meet your demands.

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Up to 1⅜" O.D.

S. C. LLOYD
. . . sales mgr. of Mechanical Handling div.

WILLIAM S. RHEEM
. . . manages Rheem's South Gate plant

JONATHAN D. FREEZE
. . . president-director of Jessop subsidiary

chinery sales, and Mr. Wright is manufacturing executive.

S. C. Lloyd was appointed sales manager, Pre-Engineered Division, **Mechanical Handling Systems Inc.,** Detroit. He was formerly connected with Rapids Standards Co. of Grand Rapids, Mich., in various capacities including that of regional manager for the southwest.

Peter J. Gallette was named general sales manager, **L. A. Young Spring & Wire Corp.,** Detroit. **William A. Clark** becomes manager of sales engineering in the Cushion Spring Division.

Harold M. Green was appointed manager of the Buffalo branch of **Trailmobile Inc.** He is succeeded as Youngstown manager by **Wallace F. Thompson.**

Frank E. Kyndberg becomes Waukegan, Ill., district sales manager of **American Steel & Wire Co.'s** cyclone fence division.

Pacific Airmotive Corp. opened an eastern region sales office in New York and appointed **Gordon C. Masters** sales manager.

Rheem Mfg. Co. appointed **William S. Rheem** manager of the South Gate, Calif., plant; **Lloyd Simonson** as manager of the Sparrows Point, Md., plant; and **Harry H. Filler** as manager of the Bayonne and Linden, N. J., plants.

Gardner Carr was appointed assistant to the president, **Marquardt Aircraft Co.,** Van Nuys, Calif. He was vice president of Glenn L. Martin Co. before serving as executive vice president, McDonnell Aircraft Co.

William D. Roberts, former project engineer for H. H. Robertson Co., joined **Ryman Engineering Co.,** Ellwood City, Pa., as vice president-engineering and research.

Richard A. Biggs has joined **Franki Foundation Co.,** Pittsburgh. His offices will be in New York. He previously was director of architectural development for Crucible Steel Co. of America.

James Norman, formerly of the Bureau of Mines and T.C.I., has joined **Senior, Juengling & Knall,** engineer and consultant firm, Birmingham, to head its mining and metallurgical division.

Jonathan D. Freeze was elected president and director of **Jessop Steel International Corp.,** subsidiary of Jessop Steel Co., Washington, Pa. Other officers elected to head the international corporation are: **Frank B. Rackley,** chairman of the board; **Charles E. Rice,** vice president and director; **G. Webber Knight,** vice president and director; and **Harold A. Ashbrook,** treasurer and director. **Adolph L. Zeman** is a director. Mr. Rackley and Mr. Rice are, respectively, president and vice president of the parent company.

Gasflux Co., Mansfield, O., appointed **J. L. Robinson** New England manager, with headquarters in New Haven, Conn.

Thomas J. Sheridan was appointed branch manager of the Philadelphia office of **Magna-Crest Corp.,** New York.

H. W. Williams was appointed manager of the electronic components division of **Stackpole Carbon Co.,** St. Marys, Pa.

Jack Melton was appointed superintendent-materials, **Texas Engineering & Mfg. Co. Inc.,** Dallas.

OBITUARIES...

Charles E. Gilbert, inventor and president of **Gilbert Mfg. Co.,** electrical equipment firm, Long Island City, N. Y., died Nov. 6 of a heart attack at the plant. He was an inventor of electrical wiring devices and plastic molding machines.

William S. Smith, 61, director of marketing, **Chrysler Motor Parts Division,** Chrysler Corp., Detroit, died Nov. 5.

Edwin S. Mills Sr., 81, a vice president and general sales manager of the former **Illinois Steel Co.,** a subsidiary of U. S. Steel Corp., died Nov. 10. He was one of the pioneers in development of stainless steel products. He retired in 1935 after 40 years with U. S. Steel and its subsidiaries.

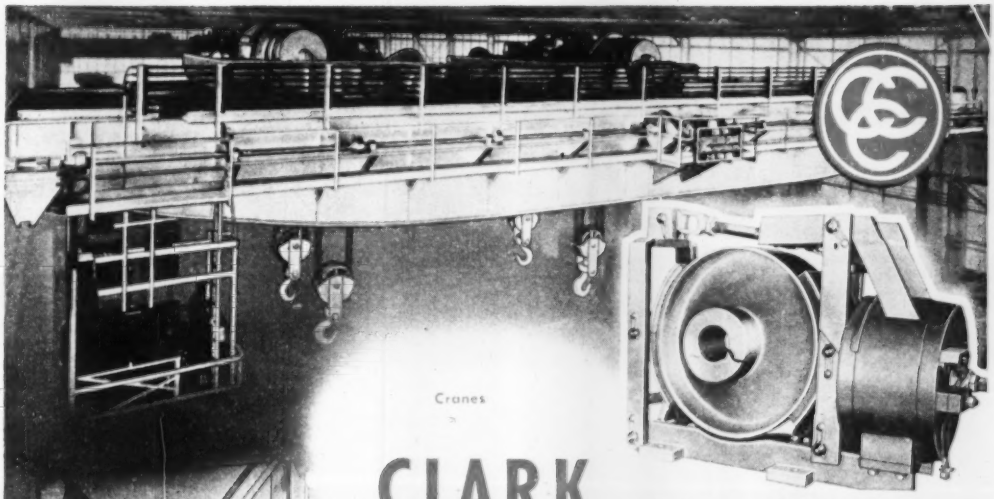
E. E. O'Neill, 58, former president of **American-La France-Foamite Corp.,** Elmira, N. Y., died Nov. 11. After retiring from the company's presidency in October because of ill health, Mr. O'Neill continued as a director.

Edward L. Penfrase, former New York manager, **Leonard Valve Co.,** Providence, R. I., died Nov. 9.

Delos E. Drucker, plant superintendent, Chandler Street Division, **Barcalo Mfg. Co.,** Buffalo, died Nov. 8 of a heart attack.

S. Ward Hamilton, 72, president of **Hamilton Steel Products Co.,** Chicago, died Nov. 5.

Roy A. Garrison, 56, a vice president, director and works manager of **Adirondack Foundries & Steel Co. Inc.,** and **Adirondack Iron Co.,** Watervliet, N. Y., died Nov. 10.



Cranes

CLARK

Clark Bulletin 106 D. C. Shoe Brake

BULLETIN 106 DC BRAKES

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After installation there is only ONE adjustment, and that's for lining wear.

And that adjustment is on TOP! Not on the sides; not on the ends; not on the bottom, but on TOP, where you can see it and get at it easily.

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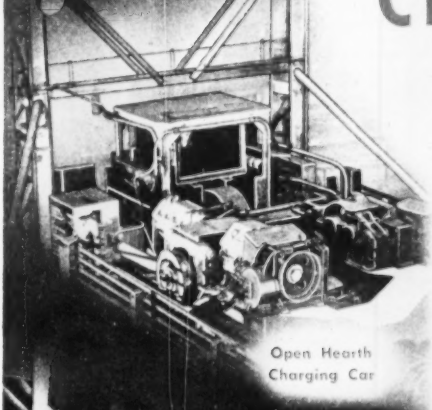
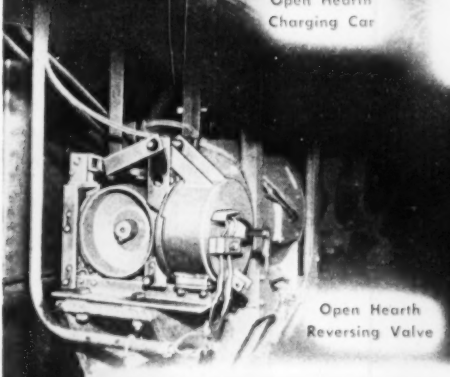
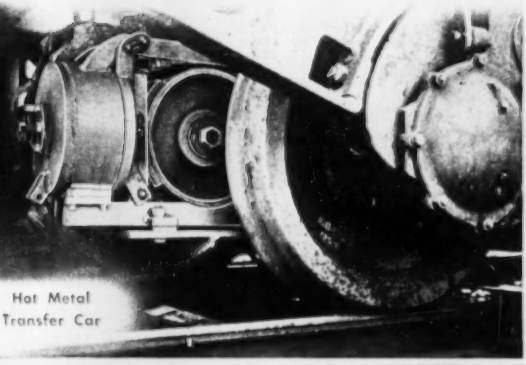


Open Hearth Charging Car



Open Hearth Reversing Valve



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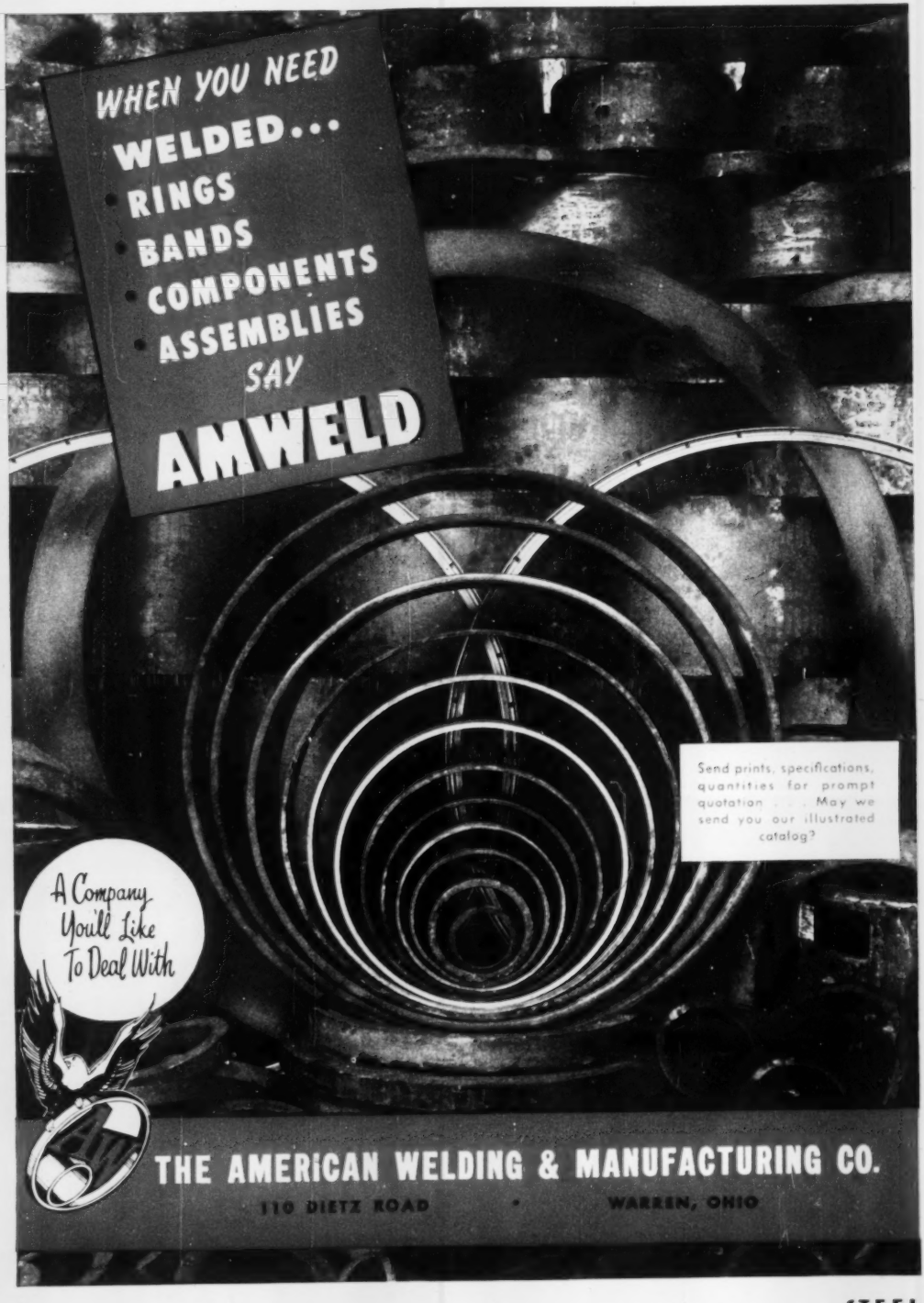
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Production AND Engineering NEWS AT A GLANCE

GEOCHEMICAL PROSPECTING—Geology and chemistry are teamed in new mineral discovery methods designed to search out underground ore deposits. They consist of extremely sensitive field tests for traces of minerals in both soil and plants. Two kinds of tests are used. One, colorimetric, uses colored solutions in which color intensity is the guide to metal concentrations. The second, chromographic, provides colored spots of definite size; intensity of the color again indicates the amount of metal present. The processes are simple and fast; chemicals and equipment are easily carried.

CONVERTIBLE CHASSIS—Distinctive feature of a new type convertible military truck-trailer for the Army Ordnance Corps is the arrangement for bolting bodies to the chasses, instead of welding in the conventional manner. This makes it possible for the same chassis to be used as the base for platform trailers, stake and rack trailers and for trailer vans. The 6-ton, single-axle cargo trailer chassis is expected to become standard for similar units used by all branches of the armed forces.

TITANIUM METALLOGRAPHY—Titanium is probably undergoing closer scrutiny in metallurgical laboratories than any other metal or alloy. But a lot of the people peering through the microscopes have no way of interpreting what they're actually seeing. Metallographic techniques have now been developed for titanium and the microstructure and mechanical properties studied for unalloyed titanium and for 0.25 weight per cent alloys of titanium with oxygen, nitrogen, and carbon under various conditions of heat treatment. p. 88

20% LESS ENAMEL—Close supervision is an effective way to save materials. An appliance manufacturer tried it out on an enamel spraying operation and came out with a 20 per cent reduction in quantity of enamel consumed. Normally total thickness on refrigerator liners ran from 0.006 to 0.008-inch. By frequent checking of thickness and keeping individual sprayers informed on how they were doing the thickness range was changed down to 0.006 to 0.007 with the mean thickness near 0.006-inch.

SUN POWER HARNESSED—Power from the sun, nature's greatest energy reservoir, can be tapped by a new device known as a "sun motor." This mechanism illustrates how sunlight can be converted into enough electrical energy to spin a balsa wood wheel on the shaft of a small motor. If sunlight isn't available, heat of a candle or light from a 150-w lamp does the job. The "motor" is being demonstrated in the General Motors "Previews of Progress" science shows. Actually, the unit is an extremely low efficiency power producer for anything beyond illustrating the principle that sunlight is power. How to harness this power for everyday chores is a problem many scientists are thinking about.

DIE PARTS REUSED—Steel dies fabricated as assemblies with standardized parts permit reuse of the die components at the end of each die casting production run. This tooling technique also facilitates repair of dies that may be burned or damaged prior to the end of the run. The method may be applicable to fabrication of permanent molds or dies for the manufacture of certain types of stampings. p. 91

TUBES AND COILS—Quantity production of a new seating assembly that combines tubular steel frames with coil springs in an integrated unit has been started by L. A. Young Spring & Wire Corp., Detroit. The single unit forms the complete front seat and back. Auto manufacturers will add only padding and upholstery to have the unit ready for installation in a car. Savings in burlap, with which springs are usually covered, are made by "flocking." By this process, each coil spring is coated with adhesive to which is added a plushy sound-proofing covering of rayon particles.

MORE ALUMINUM ON THE WAY—Expansion of primary aluminum capacity will shove production beyond 1600 million pounds in 1951 and up to 2200 million pounds in 1952. Peak World War II annual production rate was 2350 million pounds, reached in 1943. Aluminum production ranks second only to iron and steel, on a volume basis, and it is ahead of the combined cubic footage of copper, lead and zinc.

DURABILITY DOUBLED—Plentiful low-grade domestic manganese dioxide substitutes for the high-grade product found in quantity only in the African Gold Coast, in a new dry battery developed by the Army Signal Corps. While manufacture of the battery is expected to be slightly more costly, substantial economies will result from its doubled life and from the reduction in storage and shipping costs.

STAINLESS REPLACEMENT?—Plating and chemical industries are showing interest in plastic-coated nuts and bolts which resist corrosion from strong chemicals. According to B. F. Goodrich Chemical Co. makers of Geon, the vinyl plastic used, even when the plastic coat is broken, the corroding chemicals seal the wound, preventing further damage.

Metalworking Outlook—p. 51 *Market Outlook—p.163*

By THOMAS REDDEN
Allegheny Ludlum Steel Corp., Watervliet, N. Y.
and MARY JANE FIELD
Research Laboratory, General Electric Co.
Schenectady, N. Y.

Metallography of

ALLOYS OF TITANIUM

With Oxygen, Carbon and Nitrogen

TITANIUM undergoes an allotropic transformation from a hexagonal, close-packed, alpha structure to body-centered cubic, beta at 1625°F. The elements oxygen and nitrogen have extensive solid solubility in titanium, although the complete phase diagrams for these elements with titanium have not been determined; this solubility is known to be at least 0.75 weight per cent in both alpha and beta titanium. Carbon is considerably less soluble than oxygen and nitrogen. The solubility of carbon is about 0.25 per cent in alpha titanium and less than 0.10 per cent in beta titanium. These elements would be expected to have some effect on the transformation temperature of titanium, and heat treatment conditions can be chosen to point out any possible effects.

Unalloyed titanium used in this investigation was arc melted in a 7-inch diameter, water-cooled, copper crucible and forged at 1700°F to $\frac{5}{8}$-inch square bar prior to heat treatment. The alloys were melted in a 2½-inch diameter crucible as ½-pound charges. Raw materials used in the melt were sponge titanium with 160 Brinell, pigment grade titanium dioxide as a source of oxygen, chemically pure tin powder to induce nitrogen, and graphite powder as the carbon source.

Two melts of each alloy were made to provide enough material for the various tests. The brinell hardness of each ingot together with the ingot number and composition is listed in the following table. These ingots were also forged at 1700°F to ½-inch square bar:

Ingot Number	Composition (%)	Hardness brinell
X-418	0.25 O_2	223
X-419	0.25 O_2	235
X-420	0.25 N_2	273
X-421	0.25 N_2	269
X-422	0.25 C	189
X-423	0.25 C	197
X-502	*	170

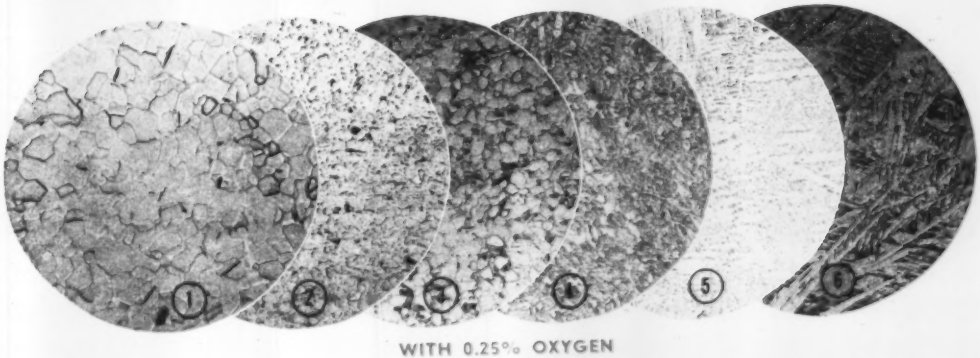
* 0.10 per cent O_2, 0.05 N_2, 0.10 Fe and 0.02 C.

A series from the heat of unalloyed titanium was given the same heat treatments as the alloys. The

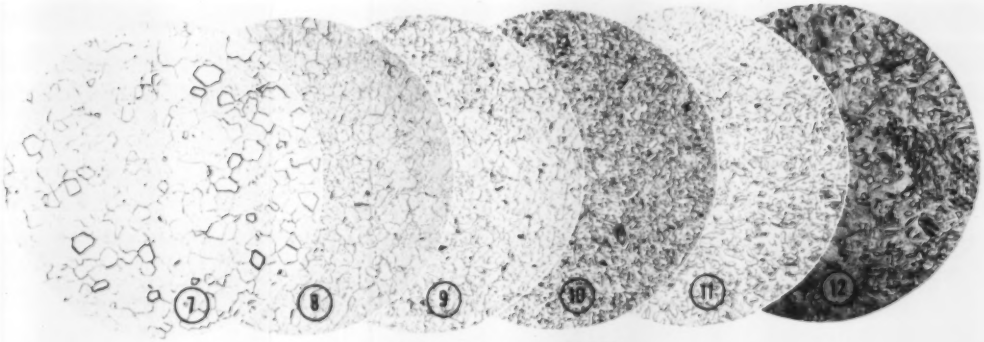
PHYSICAL TESTS AND MICROSTRUCTURES FOLLOWING VARIOUS HEAT TREATMENTS

Heat No.	Composition (%)	Heat treatment	Tensile strength, psi	Elong. (%)	R.A. (%)	Hardness R.A.	Photomicrograph No.	Microstructures
X-418	0.25 O_2	1300°F ½ Hr Air Cool	103,500	21	25.5	57.2	1	Equiaxed alpha, solid solution
X-418	0.25 O_2	1600°F ½ Hr Water Quench	99,200	25	50	56	2	Transformation starting at grain boundaries
X-418	0.25 O_2	1650°F 1 Hr Water Quench	97,000	28	50	55.1	3	85% alpha + 15% transformed beta
X-419	0.25 O_2	1700°F ½ Hr Water Quench	105,600	21	45	57.1	4	30% alpha + 70% transformed beta
X-419	0.25 O_2	1750°F ½ Hr Water Quench	109,100	22	38	60	5	Transformed beta, Widmanstatten
X-419	0.25 O_2	1800°F ½ Hr Water Quench	110,000	21	36	60	6	Transformed beta, Widmanstatten
X-420	0.25 N_2	1300°F ½ Hr Air Cool	124,000	7	13	60.3	7	Equiaxed alpha, sol.d solution
X-420	0.25 N_2	1600°F ½ Hr Water Quench	122,800	17	22.6	62	8	Transformation starting at alpha grain boundaries
X-420	0.25 N_2	1650°F 1 Hr Water Quench	114,200	21	34.8	58.8	9	60% alpha + 40% transformed beta
X-421	0.25 N_2	1700°F ½ Hr Water Quench	111,900	13	11	59	10	40% alpha + 60% transformed beta
X-421	0.25 N_2	1750°F ½ Hr Water Quench	112,500	16	20	60.1	11	20% alpha + 80% transformed beta
X-421	0.25 N_2	1800°F ½ Hr Water Quench	118,200	18	29.6	61	12	5% alpha + 95% transformed beta
X-422	0.25 C	1300°F ½ Hr Air Cool	92,800	31	61.7	57	13	Equiaxed alpha, solid solution
X-422	0.25 C	1600°F ½ Hr Water Quench	92,800	34	60.7	55.5	14	Transformation starting at grain boundaries 10% transformed
X-422	0.25 C	1650°F 1 Hr Water Quench	88,250	32	52.8	52.2	15	50% alpha + 50% transformed beta
X-423	0.25 C	1700°F ½ Hr Water Quench	84,500	24	37.9	52.5	16	20% alpha + 80% transformed beta
X-423	0.25 C	1750°F ½ Hr Water Quench	83,400	25	41.6	54.6	17	All transformed beta + titanium carbides
X-423	0.25 C	1800°F ½ Hr Water Quench	85,900	26	46.4	52.5	18	All transformed beta + titanium carbides
X-502	Unalloyed Ti 75A	1300°F 1 Hr Air Cool	72,750	30	51.3	...	...	
X-502	Unalloyed Ti 75A	1575°F ½ Hr Water Quench	70,000	34	64.6	...	19[a]	Equiaxed alpha
X-502	Unalloyed Ti 75A	1600°F ½ Hr Water Quench	68,700	32	68.2	...	...	
X-502	Unalloyed Ti 75A	1625°F 1 Hr Water Quench	66,300	32	70.1	...	...	
X-502	Unalloyed Ti 75A	1650°F 1 Hr Water Quench	67,000	32	64.6	...	...	
X-502	Unalloyed Ti 75A	1700°F 1 Hr Water Quench	67,000	33	65	...	20[b]	100% transformed beta
X-502	Unalloyed Ti 75A	1700°F 1 Hr Air Cool	58,750	35	66.4	...	...	

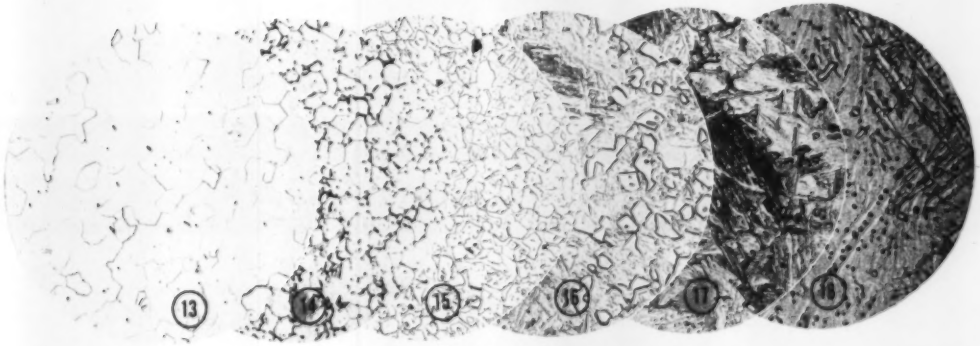
[a] Heated at 1500° F for ½ hr
[b] Heated at 1700° F for ½ hr



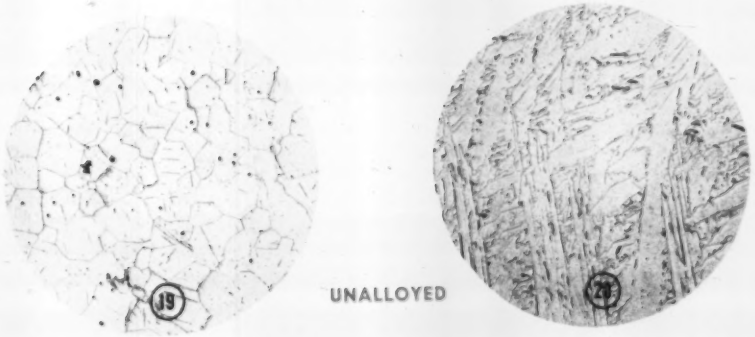
WITH 0.25% OXYGEN



WITH 0.25% NITROGEN



WITH 0.25% CARBON



UNALLOYED

tensile bars were heat treated in air in an electric furnace with the temperature controlled to ±2°F. These heat treatments, together with the resulting mechanical properties of the bars, are listed in the accompanying table. The bars were ½-inch square and 3 inches long when heat treated, and standard ASTM 0.250-inch diameter tensiles were machined from them. After tensile testing, the bars were sectioned, and transverse photomicrographs taken using the metallographic technique to be outlined.

Preparation of the specimens for metallographic study presented little difficulty. The selected surface was ground on horizontal laps using emery paper of increasing fineness up to and including 3/0. Heavy pressure was maintained during the preliminary grinding procedure to assure removal of scratches caused by preceding grinding operations. The fine scratches left by the 3/0 paper were removed after several minutes of polishing on an airplane wing cloth-covered lap, using polishing alumina as the abrasive. The final polish is obtained by using a Gamel cloth-covered wheel and the finest grade of Precisionite No. 2774. The lubricant for the two latter operations was a suspension of green soap in distilled water.

The surface produced by the above procedure is not satisfactory for detailed micro-examination because of the "flow" or disturbed metal on the surface. This type of distortion can be found on the surface of most metallographic specimens, but it is easily removed by chemical attack. These specimens were repolished and re-etched twice to assure that observations were based on the true microstructure.

Two solutions were used to obtain the etched structure. The first chemical attack was made by swabbing for approximately 2 to 3 seconds with a solution of 25cc HNO_3, 10cc HF, and 65cc H_2O. The specimens then were repolished on the final cloth until the first etch was removed. They were then re-etched with a solution of 5cc HNO_3, 1cc HF, and 94cc H_2O. A third and final polishing operation was then performed to assure the removal of flow and to bring up the desired contrast in the structure. The rate of attack of these reagents is easily controlled by additions of water or exclusion of water substituted by glycerine; however, this modification was not used on any of the photomicrographs presented here.

Tensile properties after the various heat treatments show little significant variation with heat treatment for the alloy melts. There is no increase in hardness of any of these alloys on quenching from above the transformation temperature. The unalloyed material showed a significantly lower tensile strength after air cooling from above the critical temperature, compared to that of the water quenched sample. This is most likely due to thermal strains set up during quenching. The specimen air cooled from 1300°F probably was not fully annealed at this time and temperature as evidenced by its higher tensile strength.

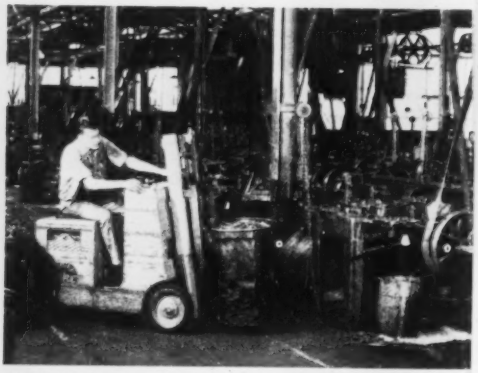
Since impurities such as iron are present in the sponge metal used to make these alloy melts the effect of the oxygen, carbon and nitrogen is to broaden the transformation range rather than to raise the temperature at which transformation starts. The effect of the iron present is to lower the transformation temperature so that the combination results in a broadening of the range.

The presence of titanium carbides in the carbon alloy quenched from above the critical temperature illustrates the lower solubility of carbon in the beta phase. The lack of carbides in the sample annealed below the critical temperature indicates at least this much solubility in the alpha phase.

The oxygen and nitrogen alloys indicate complete solubility of 0.25 per cent of these elements in both the alpha and beta phases of titanium.

Photomicrographs 19 and 20 illustrate the annealed at 1500°F and quenched from 1700°F structures of unalloyed titanium. The impurities present in the unalloyed titanium give the typical Widmanstatten structure on quenching from above the critical temperature. The 100 per cent transformed beta structure after quenching from 1700°F may be compared to the structure of the alloys quenched from 1700°F to illustrate the effect of the alloy addition on the transformation temperature.

Formed Chain Handled Easily



MODIFICATION of its fork trucks by Cleveland Chain & Mfg. Co., Cleveland, makes the handling of chain a lot easier. Formed chain made in the plant is carried from production machines to the welding department by fork truck. A special attachment is used consisting of a stub fork mounted on the truck carriage that slips under the load and a latch that grips the rim of the drum to hold it securely. Attachment makes pallets unnecessary and is easier to use than ordinary forks would be

Help for 430 Stainless Users

Where to use 17 per cent chromium stainless as an alternate for 18-8 and fabrication of the chromium stainless are the subjects of two new companion publications just issued by Armco Steel Corp., Middletown, O. Where to use bulletin describes the properties of 17 per cent chromium stainless, what care to give it, and lists normal applications, alternate uses, questionable and unsatisfactory uses.

The fabricating data bulletin covers all fabricating procedures for types 430 stainless (17 per cent chromium).

By ROBERT B. STANTON

Standardized Components Cut Die Assembly Costs

BY DEVELOPING an unusual method of fabricating steel dies as assemblies with standardized parts, McCulloch Motors Corp., Los Angeles, has been able to save considerable time and money in die casting aluminum and magnesium parts for power-driven chain saws.

Parts Reused—Purpose of this tooling technique is to permit reuse of certain die components at the end of each production run, and to facilitate the repair of dies that may be burned or damaged prior to the end of a production run. This is accomplished by producing dies as assemblies with the following basic parts:

(a) Die blocks, each being a rectangular steel slab with details required to mount a die on a given production machine. Cavity details are wedged into a suitable aperture in the center of this slab (with shims, if necessary) and bolt-assembled with the die block.

Blocks have lowered the cost of many tools by an average margin of 50 per cent, since they represent more than half of the materials that would have to be replaced if conventional dies became obsolete or damaged. Each block may be reused indefinitely.

(b) Cavities, each of which may comprise either one or several machined-steel parts (depending on the design and purpose of the cavity). Relatively simple cavities (for gears, etc.), and some complex cavities (which can be fabricated as assemblies of relatively simple parts), are machined without patterns because experience has proved that the latter represent an unnecessary expenditure in the circumstances. For example, template-like strips of hardened tool steel have been sandwich-assembled as mold cavities for the production of cylinders with integral cooling fins.

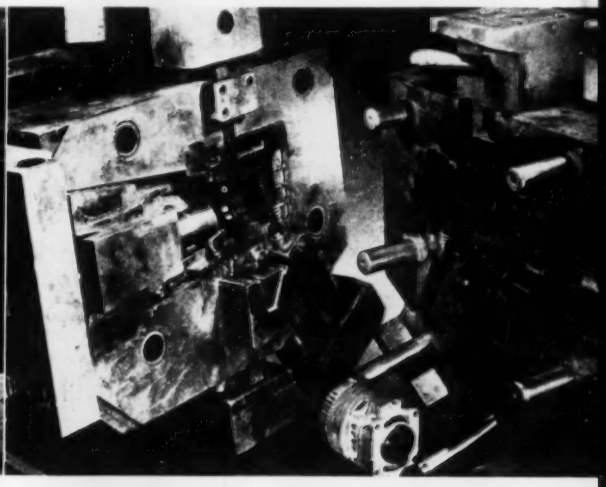
(c) Ejector pins, dowels, clamps, etc., which would be used in making conventional die casting tools.

Serve As Dies—Critical tolerances for these dies range from about 0.010 to 0.001-inch, plus or minus; from the tool designer's point of view, the cavity assemblies serve virtually all the purposes of dies comprising integral steel blocks.

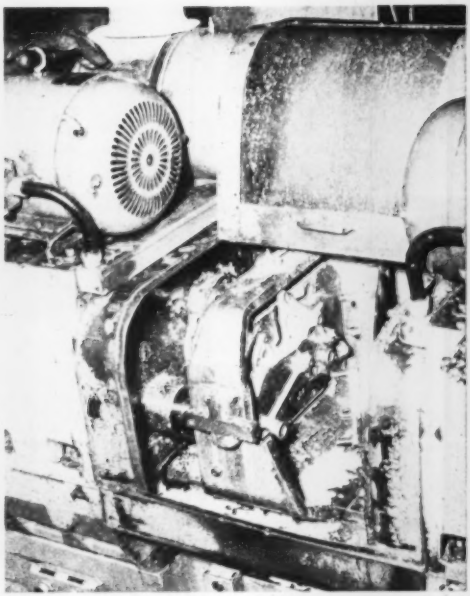
This tooling technique should be adaptable to many production operations which involve no die casting—for example, in the fabrication of permanent molds or dies for the manufacture of certain types of stampings and for the injection molding of thermoplastics.

Die cavities ready for assembly with standardized tooling blocks

Tool assemblies used in die casting cylinders with integral cooling fins



Gasket faces of gear cases and their covers are finished on a horizontal wheel in a Besley grinder. Work is advanced around the machine while fixtures turn on their own axes



Fixture gate is open to show the gear housing cover about to be clamped against the face previously ground. A total of seven holes are bored and four bosses are faced

Revamped Setups Speed Machining of

Among operations performed at high speeds are precision boring, surface grinding, air drilling, milling and tapping. Work holding devices that function with little lost motion are major contributors to economies

By HERBERT CHASE

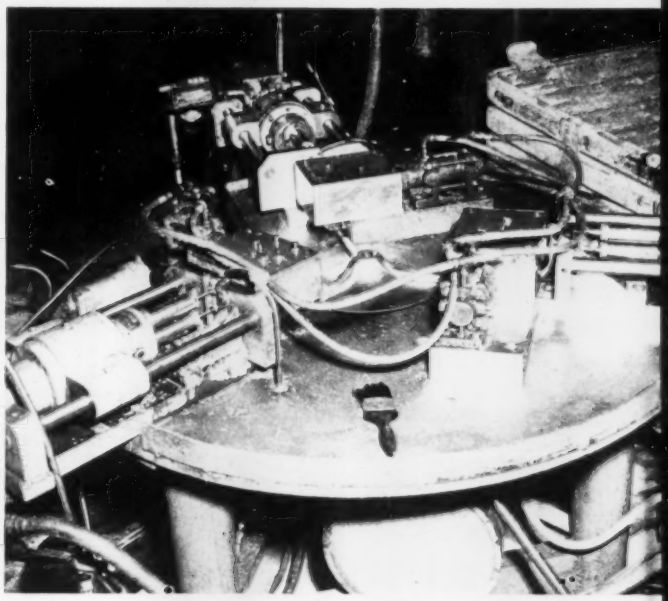
COMPETITION in the home laundry appliance field necessitates good jigs and tooling to produce high quality equipment at the lowest possible cost. With the advent of the automatic washers and driers, tolerances are more exacting so the relatively more complex equipment will give trouble free operation for a relatively long period of time. To achieve this goal and still keep production costs in line Whirlpool Corp. is keeping abreast of modern methods and effecting economies in its St. Joseph, Mich., plant. This plant produces home washers, driers and related products for sale under the company's name and under the Kenmore name for Sears, Roebuck & Co.

Among the major castings on washing machines is the gray iron gear case on which the first operation is grinding the gasket face. This is performed in the vertical spindle Besley grinder setup. Actually, each of the four work holders is merely a piece of boiler plate having a hole that follows the casting contour. The workpiece is set inthis hole, which provides about ⅛-inch clearance, and is then automatically air clamped against the face of the horizontal 72-inch grinding wheel as the work is carried around in a direction counter to wheel rotation.

One-Step Accuracy—While making its cycle around the grinder, each work holder and the workpiece itself is rotated slowly about the axis of the holder so that the position of the workpiece relative to the wheel is constantly changing. This, together with the use of a flood of coolant that prevents overheating, makes it possible to produce a face that does not vary more than 0.003-inch from true flatness, grinding from rough to finish in a single cycle.

Rotation of the work holders about the axis of the machine is continuous and takes about 1½ minutes. When a holder moves into unloading position, however, it ceases to rotate about its own axis and the clamp that holds it against the wheel under about

Head holding the eight taps lowers automatically to perform work on the gear case when fixture is pushed in by hand



Air operated Keller heads set radially around a circular table each drill two holes in legs of dryer drum spider. Drills move in at the same time and drill the six holes

Appliance Parts

35 pounds pressure is lifted. The operator removes the ground casting and puts a new one in its place.

Doubles the Output — As each workpiece moves out of the loading station, it is automatically air clamped and the holder starts to rotate under the flood of coolant. With this setup, 133 pieces an hour are ground, or nearly twice as many as in a prior setup on a disk grinder that operated dry.

A sectional wheel of No. 17 grit is employed and turns at 360 rpm. Coolant is continuously circulated and filtered and iron particles are removed by a magnetic separator. Each work holder is rotated by a sprocket that engages a chain but is disengaged during passage through the loading and unloading station. Air clamping of each fixture is effected by the piston in a 2½-inch cylinder. Plungers that contact the casting are spring cushioned and are supported on a pivoted equalizing bar.

Cast aluminum covers that fit the gear cases also have their gasket face ground in a setup duplicating that described except for suitable changes in clamping plungers to fit each workpiece. Other operations on these covers are performed in Excello precision two-way boring machines. For these operations, the casting is clamped against the carriage fixture by a gate shown in the open position.

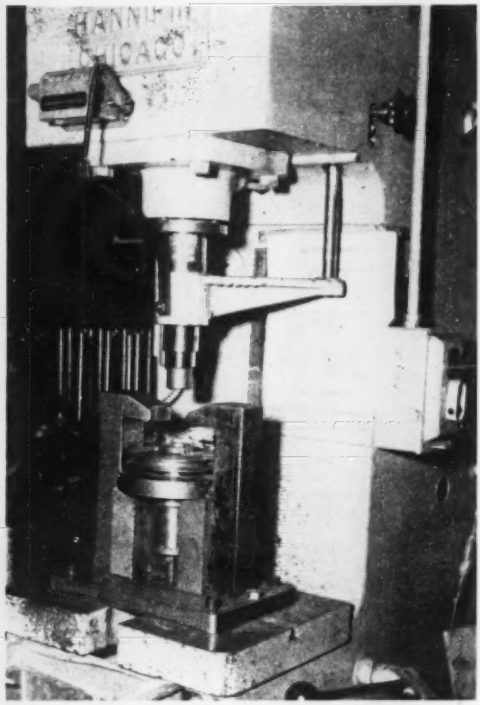
Works from Both Sides—Machines used for these operations have seven spindles at each side of the workpiece and each spindle carries a carbide tool. The carriage feeds the work into one set of spindles and then reverses and feeds them into the second set. Operations performed include rough and finish boring certain holes in one setting. In all, seven holes are bored, including ¼-inch dowel holes, and four bosses are faced. Duplicate setups in two machines turn out a total of 850 pieces per 8-hour shift.

Formerly, three separate setups on drill presses and an older type of boring machine were used and considerable reaming was done, output per man and per machine being much below that now obtained. Higher precision and better finish are also attained.

Tapping of eight gear case holes is done in a Kaufman tapper setup on 950 to 1000 pieces in 8 hours. The fixture is on a slide and, when it is pushed in by hand, the head holding the eight taps lowers automatically to do the tapping and then retracts.

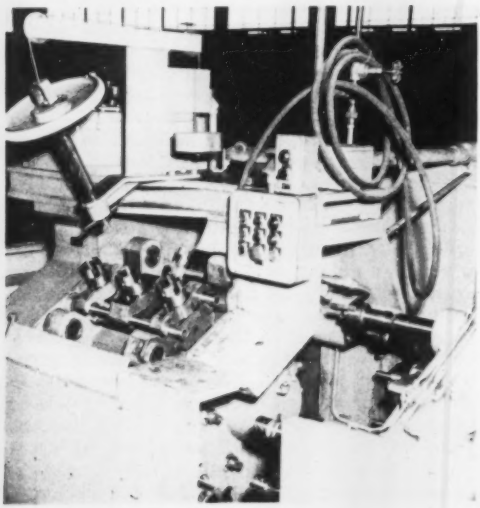
Fast Air Drilling — Considerable drilling is done with compact Keller air operated units that advance and retract quickly and automatically as soon as the workpiece is clamped in place. On a gear case setup the workpiece is set horizontally and, when locked by the clamp operated by an air diaphragm, the drills, which turn at 2100 rpm, move in and out almost instantly. Almost all the time per cycle is that required to load and unload the piece. In some similar fixtures, the drills are placed at odd angles. Operation is much faster than for conventional drilling setups.

Another Keller air drill setup, is used on a dryer



Porous bronze bushing is pressed into pulley and annular recess is filled with grease in a single press stroke

Tubes are clamped two per station in each of five fixtures on the indexing drum and operations are performed on both ends simultaneously. Work is performed at four stations and the fifth is used for loading and unloading



drum spider, the drills being set radially around a circular table. Drilling of six holes is done with the workpiece set in a central position so that each of its three legs is air clamped in front of two drills. All of these drills move in at the same time and produce the six holes quickly.

Before drilling is done on the spider, which has three arms made from round bars bent at right angles near their outer ends, the spider is placed in air clamps on a circular indexing fixture mounted on the table of a Kearney & Trecker milling machine. After each indexing, the table is fed across the cutter which produces a flat face.

Two Jobs, One Stroke—V-belt pulleys, such as the one illustrated, have a cored recess that has to be filled with grease before a porous bronze bushing is pressed into the central hole. Both jobs are done in the Hannifin press setup. The bushing is placed on an arbor fastened to the ram of the press and the pulley rests on the fixture where it is centered over a stepped plunger that extends into a cylinder below and is held up by a spring.

Screwed into the head of the plunger from below is a $^1/_4$-inch pipe connected to a grease supply by a flexible tube. As pressure is applied to the bushing by the ram and arbor, it is also applied to grease in a container not shown. As the fixture plunger is pressed down, grease flows into the plunger holes and out through the four radial holes in its head, filling the annular recess, as desired, and compressing the plunger spring. Grease flow stops as soon as the recess is filled or the radial holes are covered by the pulley hub and cylinder below it. Motion of the bushing continues until the arbor flange bottoms on the pulley face, that is, when the bushing has reached the desired position.

Withdrawal Burnishes Hole — When the ram is reversed, pressure is removed from the grease supply and the pulley is lifted because the bushing (now tight on the arbor) has contracted slightly under the pressure applied in forcing it into the hole and clings to the arbor. When the pulley strikes a stripper, the assembly is stripped off the arbor. This causes a slight burnishing of the bushing hole by the polished and precisely sized arbor and leaves the bushing hole smooth and correctly sized. The spring under the plunger raises it to initial height as the pulley is lifted and leaves the fixture ready for the next cycle.

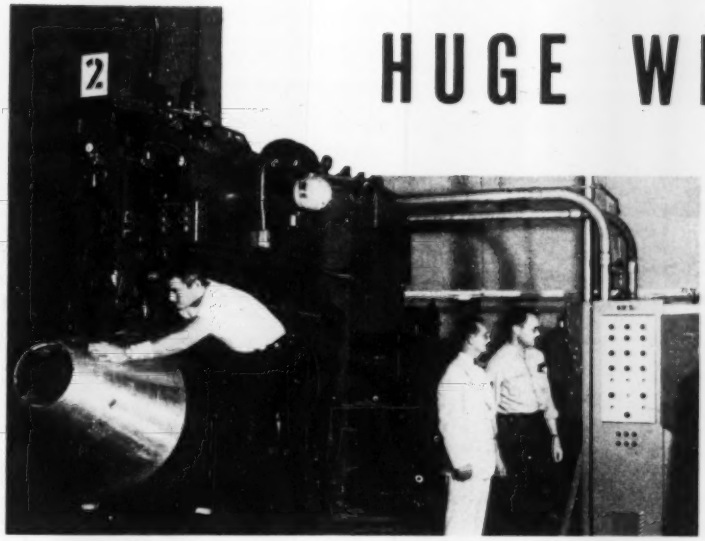
With this simple setup, 450 bushings an hour are inserted and the recess in each of the pulleys is filled with grease. This is faster than for the prior setup in which a hand operated arbor was used and a separate grease filling operation was performed.

Among parts machined in automatics is a tube or hollow shaft for driving the spinner basket in automatic washing machines. Until recently, this job was done in turret lathes and was quite slow, partly because only one end of one workpiece could be machined at a time and the tube had to be changed end for end before completion.

This job is now done in a two-way 15 x 16-inch Baker tube borer, using the setup illustrated. In this machine, operations are performed on both ends of two tubes at a time as they are indexed around the central drum. Two pieces (*Please turn to Page* 106)

HUGE WELDERS

Handle Largest Aircraft Fuel Tanks



Seam welding fuel tank nose section in electrode wheels of huge Federal welding machine. G-E control panel is shown at right

SEVERAL new resistance welding machines, among the largest of their type in the country, have just been installed in the plant of the Ryan Aeronautical Co. at San Diego, Calif. Already the largest user of welding techniques in the aircraft industry, these new machines will give Ryan capacity to handle huge aircraft structures and jet engine exhaust components.

Heavy Gages Handled—Manufactured by Federal Machine & Welder Co., Warren, O., and Thomson Electric Welder Co., Lynn, Mass., the big welders have been designed to Ryan's specifications. The Federal machines will handle such heavy gages as two sheets of either ⅛-inch thick aluminum alloys, 0.156-inch austenitic corrosion-resistant steels or 0.281-inch carbon steels. They have an unusually deep throat of 60 inches.

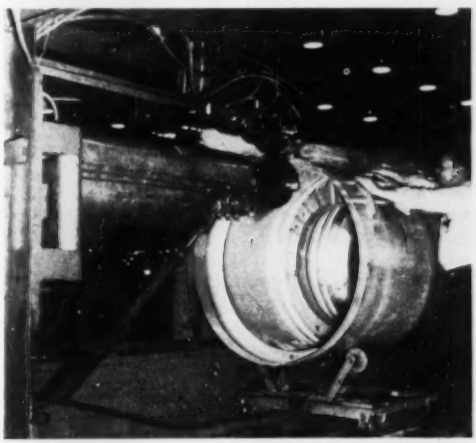
The Thomson machines are slightly smaller, with a throat depth of 48 inches and are designed to weld two sheets of aluminum alloys 0.102-inch thick. Both types can be used as spot, roll spot or seam welders by merely changing electrode tips for wheels. The tips are internally cooled by circulated water. The wheel electrodes can be cooled by flood cooling which is desirable for welding steels.

Fuel Tanks Welded—Immediate use for the equipment will be the acceleration of production of the largest external fuel tanks known to be produced for aircraft. These mammoth containers are fabricated from aluminum alloys in smooth aerodynamic configuration without external riveting or protuberances of any kind. All seams are produced on resistance welding equipment and are certified gas-tight without the use of sealing compounds.

The machines are designed to make the first spot-weld at a reduced heat, to avoid damaging the material due to heat build-up, after which normal heating is automatically provided.

Weld size is firmly controlled by contoured wheels and the wheel electrode is continuously dressed to avoid the time-consuming necessity of sending it to a lathe for turning, after every 4 hours of use. The huge upper electrodes swing out away from the work, thus permitting quick change in setup without the use of a crane.

G-E Controls—The Federal machines are controlled



Close-up of the deep 60-inch throat of welding machine designed to accelerate production of largest type of external fuel tanks for aircraft

by General Electric electronic controls which convert the 60-cycle, 3-phase line power to several lower frequency, single phase requirements. An advantage of this panel is the fixed increments for obtaining percentage of heat required. This enables operators to obtain exact duplicate settings on later work without variation.

Ryan is using the new control facilities to select heat times by arranging for full cycle firing, alternate half-cycle firing or plus or minus cycle firing as the needs may dictate. By use of plus or minus cycle firing, it is possible to obtain unidirectional spot welding in which the nugget is formed off center—an advantage in joining sheets of varying thicknesses. Alternate half-cycle firing can be used to produce the exact amounts of heating for welding aluminum alloys which require higher current values but shorter heating times.

An idea of the power of the machines can be visualized from the fact that they will develop 105,000 amp of current on short circuit across the electrodes. This is in distinct contrast to hand arc welders which develop between 50 and 75 amp. Electrode pressure runs to a maximum of 9100 pounds, from 80 pounds of line pressure.

48-Hour Coking Time Promotes Lower Ash in Beehive Coke

COKEMAKERS should not expect to get as good a uniform coke from beehive ovens as can be pushed from the by-product oven. No beehive employee, regardless of how hard he works or how great his intelligence, can be expected to maintain good burning practice by simply looking at the flame, nor to maintain satisfactory combustion control simply by using mud here and there. Uniformity of the coke is bound to fluctuate under such practice.

This is the opinion of F. A. Dudderar, division superintendent coke plant, United States Steel Co., who spoke on the "Preliminary Physical Testing of Beehive Coke" at the annual joint meeting of the Eastern States Blast Furnace and Coke Oven Association and the Blast Furnace and Coke Association of the Chicago District, Hotel Statler, Cleveland, Nov. 2-3.

Merits Not Considered—The author in presenting details of a research program of evaluating beehive coke made it plain that the merits of beehive and by-product coke were not at stake nor were any of his statements to be taken as arguments for the two grades of coke. Tests disclose that beehive coke made from coal taken from the same mine and seam varied in chemical and physical analysis. In 72 samples of 180 pounds each the sulphur varied from 0.76 to 1.64 per cent and the ash from 10.0 to 19.90 per cent. The daily average showed sulphur varying from 0.85 to 1.36 per cent, the ash from 10.93 to 17.78 per cent, and the fuel value determined by the Clairton method from 45 to 141.

Relative results in long and short coking time showed 48-hour beehive coke to have an advantage in ash and strength over the 96-hour grade. The 48-hour coke showed a daily average of 13.2 per cent ash and 107 fuel value whereas the 96-hour fuel averaged 14.3 per cent ash and 91 fuel value.

Appreciably higher fuel values were registered by beehive than by by-product coke using the same coal. While the beehive grade varied over a wide range its average fuel value was about 100.

There was some question in the mind of one blast furnaceman whether the Clairton tumbler test as applied to the two cokes would yield comparable results. Nothing definite along this line was brought out save that the test was designed for by-product coke. The desirability of comparing the two grades of coke is a job that cannot be accomplished by cokemakers; results in the blast furnace is what counts and therefore this factor is related to both coke plant and blast furnace operators.

At one plant in the Pittsburgh district a normal check of incoming coke shipments from all sources is made for ash content and the various grades are blended on the basis of the tumbler test. A spot check of the blended coke going into the blast furnace follows.

Appraises Beehive Coke—One furnaceman stated that in his opinion you can get just as good results in a blast furnace with beehive coke as with by-product coke provided the coal is given the same treatment in each case. Others were of the opinion that a chemical coke oven must be justified by its output of chemicals rather than its coke.

In discussing blast furnace performance in the light of coke grades one furnace operator cited the performance of two stacks pointing out that the best furnace performance was secured from high ash and high sulphur coke whereas the best grade coke gave the poorest overall total performance.

E. R. Miller, division superintendent blast furnaces and coke ovens, United States Steel Co., in describing the new Fairless plant, at Morrisville, Pa., mentioned that the steelworks is the largest integrated plant to be erected from the standpoint of time. After 35 weeks of construction the plant is 35 per cent completed. Plans are to have certain products reach the market in the first quarter of 1952.

The site is considered favorable to justify the investment; it is near seaboard, the water supply is ample and transportation facilities unique. Half of the 3800-acre site will be in use. Eventually 175 acres will be under roof.

The coke plant will supply 37 million cubic feet of coke oven gas daily. This with blast furnace gas will be ample for one-half the plant requirements, the remainder to be purchased. Each blast furnace will be served by an electric precipitator for cleaning the gas for the hot blast stoves and other purposes. Sized ores will be used. Blast will be supplied by turboblowers of 110,000 cfm capacity and high top pressures will be employed.

The bar mill will have a delivery speed of 3000 fpm, the fastest ever built. The 5-stand 48-inch tandem cold mill for tin mill sizes with a delivery speed of 7000 fpm will be the fastest in the world. An 80-inch temper mill with a delivery speed of 3900 fpm will be the fastest in the industry.

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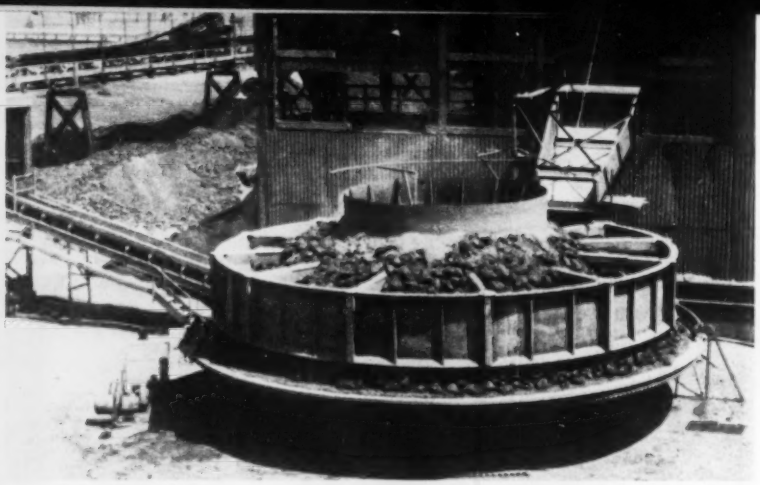


This general view shows the rotary sinter cooler installed at the Kaiser Steel Corp. plant, Fontana, Calif.

NEW ROTARY UNIT
Cools Sinter Economically

This novel method, which cools by ordinary atmospheric conditions without the aid of water or blowers, eliminates disintegration and breakage of the sintered product

By F. R. GREYSON
Chief Metallurgical Engineer
Kaiser Engineers
Division of Henry J. Kaiser Co.
Oakland, Calif.

SINTERING, as used in the steel industry, serves the function of providing strong, cellular, porous iron ore suitable for charging into a blast furnace. Ore fines, and flue dust which is collected from the blast furnace operation, can be re-charged if they are fused into a larger mass. This is accomplished by burning a fine layer of ore together with a small amount of fuel. As the fuel ignites, air is drawn down through the bed and burning progresses downward. Sufficient heat is developed to agglomerate finely-divided mineral particles by fusion. This, roughly, is the sintering process.

Products which are fused must be cooled so that they can be handled by ordinary conveyors. It is necessary to reduce temperature of the sintered ore from about 1500 to 200 F. The method of accomplishing this cooling will be discussed.

In 1943 the writer was given the responsibility of designing a sinter cooling plant for Kaiser Steel Corp. Tests conducted to determine time required to air-cool the material properly showed two hours to be the optimum.

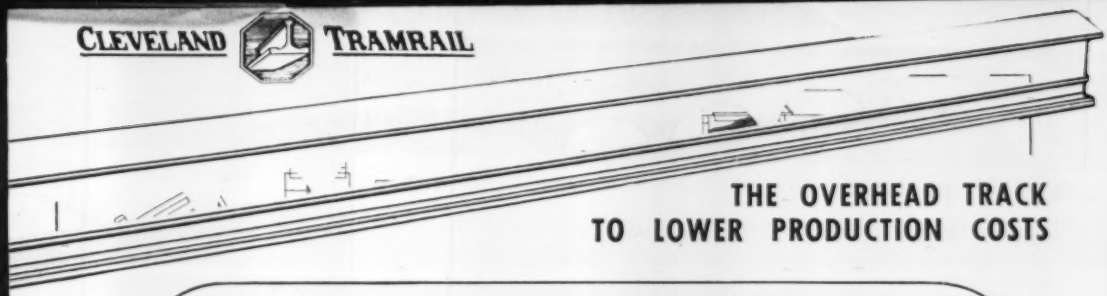
Consideration was given to providing an apron conveyor, conveying ribbons of sinter. Cooling was required for sinter from two 62.5-ton sintering machines. This ribbon would be about 7 feet wide, 18 inches deep and 480 feet long moving at 4 fpm. Cost of such a conveyor would be prohibitive and the length too great to fit reasonably into any layout.

Attempts to eliminate the need for a longer conveyor led to the idea of stacking ribbons of sinter one on top of the other. This, in turn, led to development of a circular arrangement and the final design of the Kaiser rotary sinter cooler.

Cools 2500 Cubic Feet Hourly — Cooler installed at the Fontana steel plant has a mean diameter of roughly 39 feet and is approximately 122 feet in circumference. It is able to cool sinter from two sintering machines, each rated at 62.5 tons per hour. Assuming sinter density of 100 pounds per cubic foot, required input and output of the unit is 2500 cu ft per hour.

Conical cross-sectional area of the cooler is roughly 50 sq ft. The ribbons of sinter are in five layers, so that each layer contains 10 cu ft per running foot (which is roughly what the ribbon of sinter on an apron conveyor was calculated to carry). In one complete revolution of the cooler, 1225 cu ft of material will be removed. It must operate at 2.04 revolutions per hour in order to meet a production capacity

CLEVELAND TRAMRAIL



THE OVERHEAD TRACK
TO LOWER PRODUCTION COSTS

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Plenty of cranes in this Diesel motor plant ease the work and boost production.

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Cranes save many costly man-hours of skilled mechanics by enabling one man, in most cases, to pick up and move heavy or awkward parts that ordinarily require hard and dangerous work by several men when lifting and tugging by hand.

Even where light loads are lifted only a few times a week, it has come to be realized that the cost of Cleveland Tramrail cranes is well justified because they are a tremendous factor in the elimination of hernias, smashed hands and feet, wrenched backs and other unnecessary injuries.

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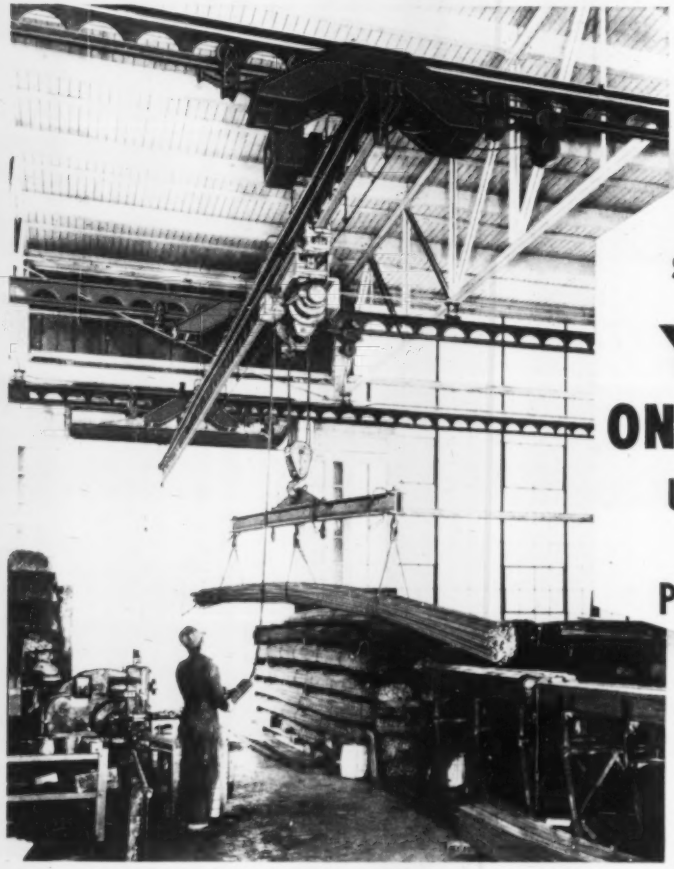
THE OVERHEAD TRACK TO LOWER PRODUCTION COSTS



SAVES $5,000 YEARLY ON STEEL COST

Unloading Time Cut 2 Hours Per Railroad Car

5-ton, 3-runway, 50-ft. span, completely motorized Cleveland Tramrail bridge operated by pushbuttons from floor. Bridge is shown interlocked with track extending out doorway over railroad. This Tramrail system has been in service since 1943.

A handsome dividend is being earned by the Kortick Manufacturing Co., San Francisco, Calif., on its Tramrail transfer bridge installation.

Because the bridge is of 5 tons capacity, the rods, bars and angle iron which Kortick uses for the manufacture of pole line hardware, can be bought and handled in 5-ton bundles. This eliminates a bundling charge made for smaller bundles. The savings is $2.00 per ton. As Kortick takes in an average of 200 tons per month, the monthly saving amounts to $400.

The bridge interlocks with an outside Tramrail track that extends over a railroad track. This enables the hoist carrier to deliver steel directly from railroad cars to any point inside the building served by the bridge. Because of this feature and the fact that heavier bundles are handled, a saving of about 2 hours unloading time is made per 50-ton car of steel, over their former method which employed a 3-ton hoist.

Obviously with total savings running in the neighborhood of $5,000 yearly, it did not take long for this Tramrail installation to pay for itself.

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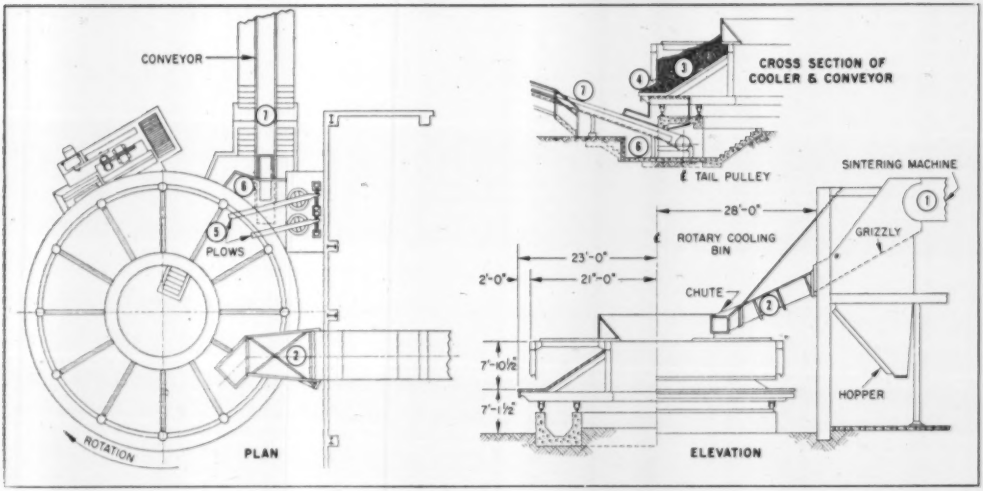

General arrangement of the rotary sinter cooling bin. Numerals refer to flow of material which is fully described in the text

of 2500 cu ft per hour. This is an operating speed of 4.2 fpm.

Since the sinter is in five layers, each layer will revolve five times at 2.04 revolutions per hour. Total retention time is in excess of two hours for the revolutions. This is the time which tests indicated would be required for cooling.

Cooler Described — In general terms the cooler is a rotating bin, 8 feet deep, made up of a flat disk or ring, 46 feet outside diameter by 36 feet inside diameter, with a truncated cone concentrically mounted thereon. Base of this cone is 36 feet in diameter, the truncated top being 16 feet in diameter, about 6 feet above the base. This combination forms the bin bottom. Superimposed over the cone is a cylinder 42 feet in diameter by 6½ feet high, suspended from radial arms from the inner cylinder, forming the outer bin wall; this outer bin wall stops about 18 inches above the top of the disk, thus leaving an annular opening for discharging material by means of plows or scrapers located at any desired point on the periphery. The bin is mounted on a suitable structural steel frame, carrying two concentric rows of wheels or casters, running on two circular tracks, mounted on a concrete foundation.

The unit described is currently being used for cooling sinter only. It has been designed, however, for use with coke, cement clinker, burnt lime and any type material which must be treated at high temperatures to reduce the problem of handling the materials, particularly any that are to be transported by conveyors, or distributed into bins or cars.

Material Flow Through the Cooler—Flow of mateiral is shown above as follows: Ore fines and flue dust are agglomerated to form sinter at the sintering machine which is delivered to the cooler by means of chute (2). Difference in elevation between outlet gate and cooling bed is regulated so that distance dropped is at a minimum and breakage of sintered particles is reduced. Sinter is deposited in layers onto the cooler's sloping bottom which is protected by a brick lining. As cooler revolves, sinter particles are exposed to the atmosphere at opening (4) and by openings at the cooler's top. The sinter revolves with rotation of the bed and as particles are removed from the bottom, top particles work progressively downward. Stationary plows remove the bottom layer of sinter allowing the material above it to move downward. Plows remove sinter which falls into a pit (6). By a system of conveyors, cooled sinter is removed from the pit.

Cooling is accomplished by ordinary atmospheric conditions without utilizing blowers or water. The rotating bin is propelled by means of a ring gear and pinion, gear reducers, and suitable guide rollers to insure its concentric rotation.

The process and the machine have been patented by the writer and assigned to Kaiser Steel Corp., which, in turn, has licensed Arthur G. McKee & Co. to manufacture and market the unit.

Stock Investment Cut 40 Per Cent

Subdivision of an activated inventory control system for a static stock record enabled the Boykin Tool & Supply Co., Atlanta, to cut 40 per cent of its capital investment in stock. Pamphlet SN774 published as an aid to management by Remington Rand Inc., 315 Fourth Ave., New York, details the methods that brought about this considerable saving.

Use of visible signals and files has reduced posting time and costs as well as made accessible current stock status and eliminated unnecessary duplication of items. Essential records, such as purchasing receiving, sales summaries and back orders, are combined in one compact unit and the visible signals cut posting work to a minimum. The company estimates the cost of the whole system and equipment, plus supplies sufficient to keep it in operation for a number of years, came to less than the equivalent of one clerical salary for one year.

Here's the Most Written on Using

Are You Interested in Cutting Production Costs?

Here at last is a complete reference library for the man who wants information on when, where and how to use the various production processes. Packed into these two volumes is a plain, practical, common sense explanation of the 54 major manufacturing methods that can be used in the production of all types of machine parts. Each chapter covers a different process and is arranged to show:

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2. How to design to suit the process
3. Selection of suitable materials
4. Precision levels that can be maintained

These books give you the kind of on-the-job help you need in considering the use of various processes. They can be of use in any shop—large or small. Whether a job involves machining, stamping, forging, metal spraying—or any of the scores of other operations—these books tell you exactly what to consider in using a specific process. Here are the specific advantages and disadvantages of each method . . . and the design pitfalls to avoid. Here also are the key production factors to consider when using any process—plus valuable information on the most economic precision levels and minimum production levels. Now you can eliminate guesswork over the question of whether the material can be worked economically, or that tolerances and finishes you desire can be met. You can eliminate redesigning, additional expensive operations and high rejection costs.

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These are the most practical books ever written for production men and design engineers. They are complete . . . authoritative . . . plainly worded and clearly illustrated. The fundamentals, methods, and data they present have been gathered and written by Roger W. Bolz, Associate Editor of MACHINE DESIGN magazine and one of the nation's leading authorities on the subject of how to get maximum production at lowest cost.

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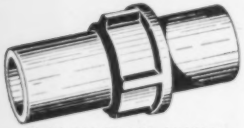

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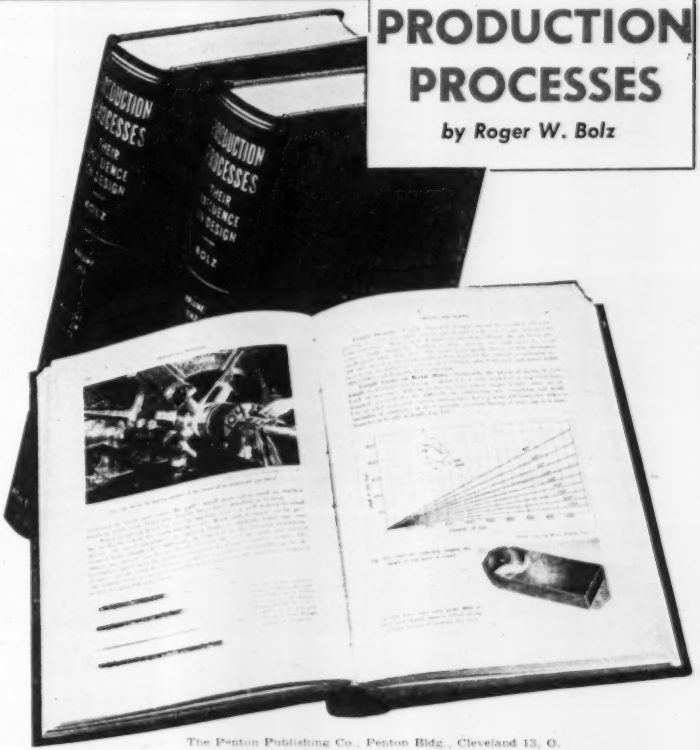
by Roger W. Bolz



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ADHESIVE METAL NAMEPLATES

Give Permanent Identification

EVOLVING from a project to make better decals for Boeing Stratocruisers in 1946, millions of paper-thin aluminum appliques now are being produced for use on hundreds of objects ranging from golf clubs to refrigerators in addition to airplanes. The product, trade-named Metal-Cal, was developed by Boeing Airplane Co., Seattle, to replace the fragile conventional "No Step", "Jack Here" and similar paper appliques mounted by the hundreds inside and outside most airplanes.

Today, Metal-Cals manufactured by Boeing for use on its own Seattle Division products and under license by C&H Supply Co., Seattle, for the outside market are standard equipment on almost every major aircraft type built in the United States and have branched far afield into hundreds of nonaircraft applications as well.

While the paper transfers used previously were inexpensive to make and simple to apply, they were not permanent. Metal-Cals are almost abrasion-proof, stick solidly and easily to any smooth, perfectly clean surface and are little more expensive than the paper decals when produced in quantity. They are made from paper-thin aluminum stock, have indelibly dyed letters and, in their latest edition, have a cellophane-covered cement backing to make application even more simple.

Secret of Success—Key to Metal-Cal production at Boeing's own shop is the manner in which the 0.003-inch-thick aluminum stock is processed so that die-fast letters can be imprinted on it. First, a color retentive coating is created on the surface of the foil by chemical reaction. Printing then is applied by a standard Multilith offset process. More exacting than color film developing and printing, the processing can be made to reproduce any color.

Metal-Cals have shown great resistance to abrasion. Subjected to the Tabor abrasion test—a process in which an object is rotated like a phonograph record under an abrasive arm—they have remained legible after 18,000 wearing cycles. Under similar tests, the best of conventional paper decals became illegible after fewer than 1000 cycles.

Man in a Hurry—Development of the process was accomplished with remarkable speed. Only eight days after Boeing research engineer Robert N. Page received instructions to find a process to make a more durable type sign, he and his group completed the first successful sample. Within a month a complete shop had been set up to make them on a production basis.

A progression of improvements since has been made on these adhesives both by Boeing and C&H Supply. The most recent postage stamp type, developed with the co-operation of Minnesota Mining & Mfg. Co., shows extraordinary sticking quality on the exteriors of airplanes.

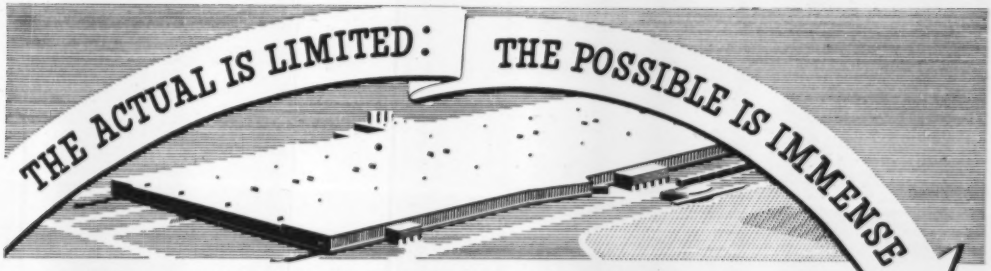
While Boeing's Seattle Division maintains its own shop, producing 1500 to 2000 Metal-Cals for each new B-50 Superfortress or C-97 Stratofreighter, C&H makes the adhesive metal nameplates for the B-47 Stratojet being built by Boeing at Wichita, Kans. For this airplane alone they have delivered more than 3500 types.

Expansion Unlimited—Starting with a $35 order in May, 1948, C&H has produced more than 50 million

Completed Metal-Cals are applied to an auxiliary motor in the lower forward cargo compartment of a Boeing KC-97E cargo-troop-aerial tanker airplane. These labels stick solidly to metal background and remain legible indefinitely

of the new labels to date. They are used as nameplates on golf clubs, fish poles and ski poles; on products manufactured by Westinghouse and General Electric, and by Northwest Airlines, Trans World Airlines, United Air Lines and Braniff Airways Inc.

Others using Metal-Cals are Emerson Radio, Montgomery Ward, Emerson Electric, RCA's Victor, A. O. Smith, True Temper Corp., Foote Brothers, Leeds & Northrup Co. and Benson Mfg. Co. Many other manufacturers will soon be added to this list. Following mention of this development on STEEL's Production and Engineering News at a Glance page in the Aug. 6 issue, the editors were buried under a flood of letters inquiring as to the manufacturer's name.



NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

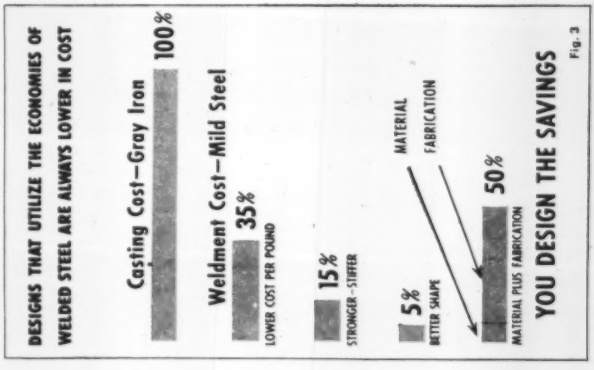
© LE Co. 1951

Welded design builds stronger products ...at half the cost

THE proper use of welded steel strengthens the construction of many products while cutting costs 50%.

As shown in Fig. 3, a simple duplication of a design in mild steel generally reduces material costs to as little as 35% of traditional gray iron construction. However, when designs utilize the inherently greater strength and rigidity of steel, still fewer pounds of metal are required and material costs can be cut to 15%. Ultimately, the efficient use of formed engineering shapes from sheet or plate can eliminate further metal, cutting the material expense to as low as 5%. With these substantial savings in material costs, the designer has a latitude of 35% to 45% in which to fabricate and still realize overall cost savings of 50% in the manufacture of his products.

Whenever weldment costs do not approximate this yardstick, designs generally are falling short of incorporating the full economies of welded steel. A Lincoln Welding Engineer will gladly demonstrate how you can benefit on present and future product developments. Call or write.



PROPER DESIGN IN WELDED STEEL ALWAYS IMPROVES PRODUCT AND LOWERS COST

Fig. 1—Original Construction *of hanger. Cost....$5.20. Weight 18 pounds.*

Fig. 2—Present Weldesign in Steel *Saves 52% in cost. Costs....$2.50 Weighs 12 pounds.*

Photos courtesy Dorsey Trailer Company, Elba, Alabama.

HERE'S MORE PROOF

Machine Design Sheets are available to designers and engineers. Simply write on your letterhead to Dept. 612.

THE LINCOLN ELECTRIC COMPANY

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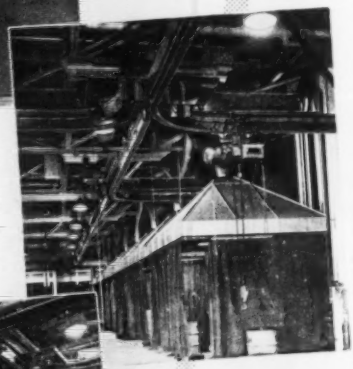
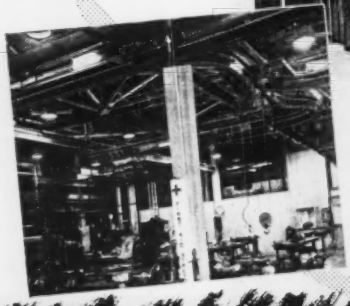
Railmaster 3-ton crane serves the paint shop area and interlocks via track curve with crane serving the sand blast room. Interlocking track is equipped with opener to allow fire door closure.



Track and switches with spur tracks over welding booths for easy spotting of heavy loads in booths.



Compact track and crane system over the electrical shop area. Note hand chain drop section on extreme left, which lowers a hoist carrier for service or repair.

MONORAIL REDUCES
Maintenance Costs

In this, one of the country's largest maintenance shops, American MonoRail Overhead Handling Equipment serves the entire department. Included in the department are: machine shop, electrical repair, metalizing room, welding, painting and sand blast room, pipe shop, and inside and outside storage. This plant has shown a definite increase in efficiency and a great reduction in handling costs.

Let an American MonoRail engineer show you how you can cut handling costs and save valuable floor space.

WRITE FOR C-1 BULLETIN

THE AMERICAN MONORAIL COMPANY

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Setup Speeds Machining

(*Concluded from Page 94*)

are loaded at a time in V-grooves with each end of each tube overhanging the groove. Clamping is done with a counterweighted hand wheel wrench whose lower crossbar fits into slots in large castled nuts above the clamp bars.

Savings Are Substantial — After loading, the two workpieces are indexed through four stations at which the following operations are performed automatically: 1. Face and chamfer one end and face and rough turn to a shoulder at other end, 2. core drill both ends, 3. bore both ends and finish turn at shoulder, 4. cut external grooves. Carbide tools are used at first three stations, others are Tantung G. The fifth station is for unloading and reloading. With this setup, 156 tubes per hour are completed and the machine has to run only one shift per day. Before, three turret lathes could produce only 150 pieces per machine in 8 hours and had to be run three shifts, hence savings in the new setup are large.

Another Baker machine, is employed to produce gear case mounting studs at the rate of 3600 in eight hours where, before, the same job was done in a special machine equipped with retracting heads that drilled, tapped, faced and counterbored in successive operations, with hand shifting between, at the rate of only 200 an hour. In the new machine, four blanks are loaded at a time (two at each of two stations). Clamping and indexing are automatic, clamping being done by air operated wedges. The Baker machine performs the same operations that were done before. They include drilling a hole 2 inches deep. Finally, the pieces are unclamped automatically and are pushed out by a rocker arm. These studs are produced in different lengths that require only slight changes in the setups of the same machine.

Outlined above are only a few of many jobs that merit attention but they are sufficient to indicate that tooling and production personnel keep abreast of modern methods and are constantly effecting economies through changes of the type here described.

Copper vs Corrosive Agents

Results of work done by American Brass Co.'s technical staff through laboratory research and field study to determine the nature of corrosive attack on copper and copper alloys are published in a 24-page booklet, "Corrosion Resistance of Copper and Copper Alloys." This publication, one

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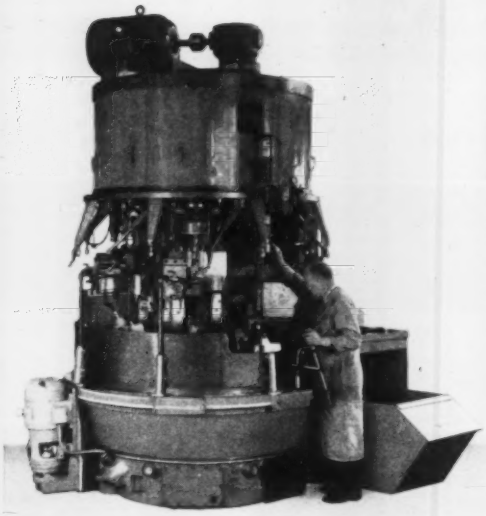
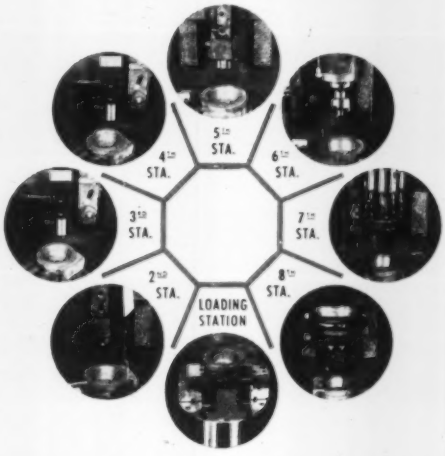


THE BULLARD MULT-AU-MATIC METHOD



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There's a Foresighted story in the 1928 Edition of "The Mult-Au-Matic Method". Write for your copy—Refer to "Tradition".

THE **BULLARD** COMPANY BRIDGEPORT 2, CONN.

of the first in the industry, explains the chemical and physical nature of corrosive attack in its various forms. A tabulation is included indicating relative corrosion resistance of principal types of copper and copper base alloys when in contact with 183 different corroding agents. Booklet, Anaconda publication B-36, is available without charge from American Brass Co., Waterbury, Conn.

Turbine Tests Succeed

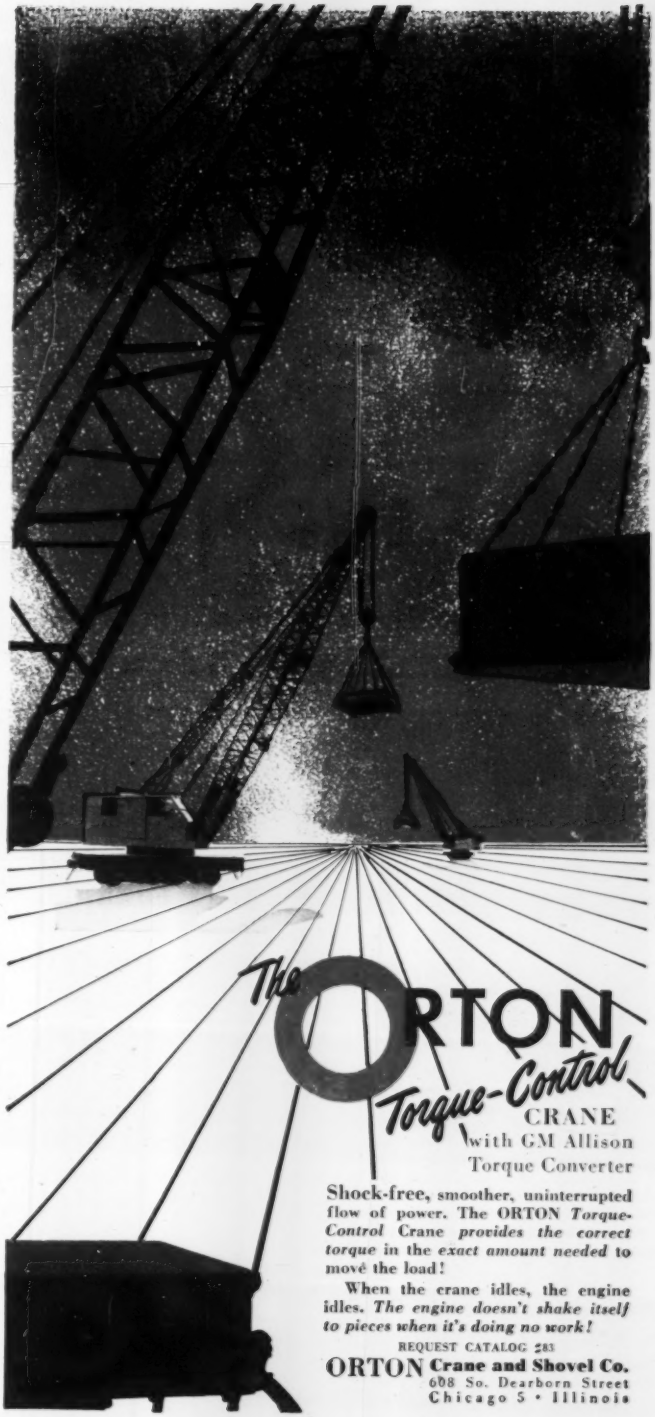
Boeing Airplane Co.'s testing program for its experimental gas turbine engine is a success, says Henry C. Hill, assistant chief engineer, Gas Turbine Division. Speaking at the SAE national transportation meeting in Chicago, Mr. Hill reports the automotive portion of the tests succeeded in two ways: Road testing demonstrated the turbine's adaptability to use in a heavy-load vehicle; and the turbine-powered Kenworth truck—first of its kind—developed some mechanical "bugs" in its 175 hp, 200 pound engine that couldn't have been uncovered in the laboratory.

Boeing's gas turbine is under development for the Bureau of Ships, which made both engine and truck available for tests. General design is similar in principle to the jet airplane engine, but power developed is harnessed effectively by a secondary turbine to turn the shaft instead of being exhausted as jet thrust. Potential applications for the engine are increasing, adds the engineer. Propulsion tests are being made with a unit installed in a Navy personnel boat and a Bureau of Ships contract calls for production of several to operate electric generators on Navy minesweepers.

Fabrication Facilities Described

An eight-page illustrated bulletin is offered by Colonial Iron Works Co. to show its engineering and fabricating facilities for a wide variety of tanks, kettles, towers, reactors and similar equipment. Photographs show views of fabricating operations, machinery and completed products. Described are facilities for shearing, forming, fitting and welding to meet the ASME and API-ASME codes. Inspection methods including the company' own radiography department are shown and described. Plant layout drawings show flow in of structural and plate parts and flow out of completed units to give the reader an idea of the efficient handling methods employed in the plant.

Table and charts are used to outline maximum dimensions that the company can handle, also the range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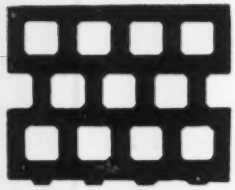

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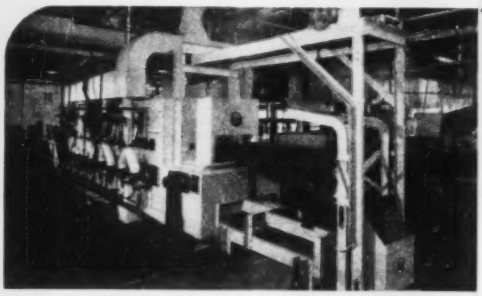

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A SIZE AND TYPE OF FURNACE FOR EVERY PROCESS PRODUCT OR PRODUCTION

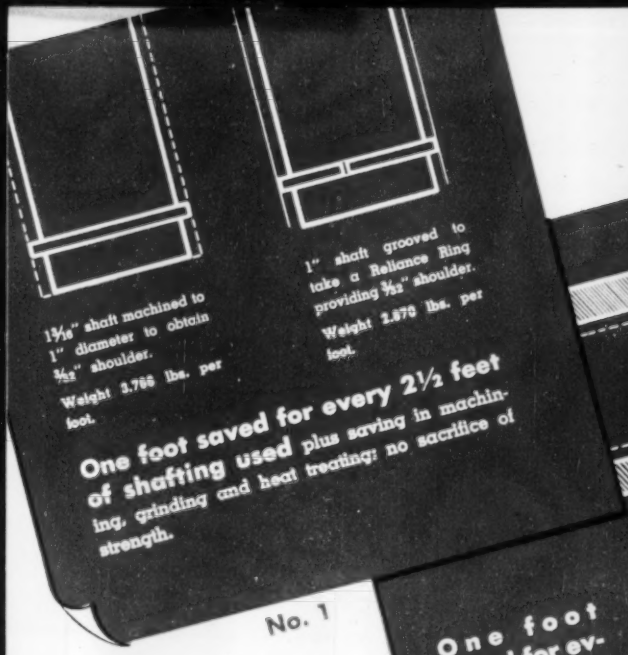
of plate thicknesses in various alloys along with test pressures available for air and hydrostatic checks. The wide range of stainless and alloy steel and other metals that Colonial is accustomed to using is detailed in a third chart. The bulletin also outlines three ways the company can assist with materials selection and basic design engineering for a single unit or a number of units to be used as a complete project. A copy of this 8-page plate fabrication bulletin may be obtained by writing to the company, 17631 St. Clair Ave., Cleveland 10.

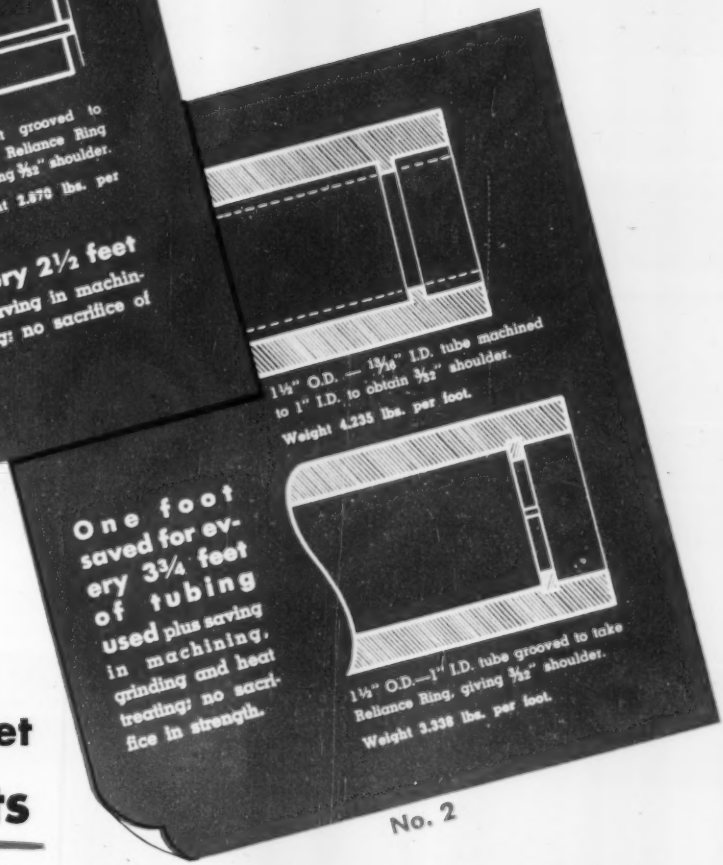
Increasing Die Life

From a study completed on die life in bending and forming steel plate and sheet metal in press brakes, Dreis & Krump Mfg. Co., Chicago, reports its induction-hardened dies show 10-20 times more useful life than conventional, heat-treated dies. This study covered dies in use up to five years and included a wide vari-

Roller Tracks Ease Handling

ROLLER-TRACK sections installed at each of seven elevator landings in building No. 8 at Stewart-Warner Corp.'s main plant in Chicago permit a moderate capacity Otis elevator to move over 200 tons of pallet-loaded automotive instrument and Alemite parts daily. Fork-truck operator brings a pallet load to the elevator, sets it down on the track, signals the elevator and goes to pick up another load. Since the roller track sections are laid right up to the sill of the elevator and similar sections are laid inside, operator can load and unload without help. The elevator is capable of making 265 round trips per 8-hour day, carrying one or two pallets per trip


1 3/16" shaft machined to 1" diameter to obtain 3/32" shoulder.
Weight 2.766 lbs. per foot.
1" shaft grooved to take a Reliance Ring providing 3/32" shoulder.
Weight 2.670 lbs. per foot.
One foot saved for every 2½ feet of shafting used plus saving in machining, grinding and heat treating; no sacrifice of strength.
No. 1


1½" O.D. — 1 3/16" I.D. tube machined to 1" I.D. to obtain 3/32" shoulder.
Weight 4.235 lbs. per foot.
One foot saved for every 3¾ feet of tubing used plus saving in machining, grinding and heat treating; no sacrifice in strength.
1½" O.D.—1" I.D. tube grooved to take Reliance Ring, giving 3/32" shoulder.
Weight 3.338 lbs. per foot.
No. 2

how to get more parts per ton of steel

- You buy steel by the pound or ton but you sell it by the piece or foot after performing various fabricating operations on it. If you are able to cut down the cross section used for any part you can reduce the weight per foot and get more parts per ton.
- Illustration No. 1, of a shaft application, shows how you can stretch your steel supply and, at the same time, make important savings in machining and other production operations by the use of Reliance Rings.
- Illustration No. 2 shows how you can cut production costs and effect a steel saving in a counterbore application.
- If these applications suggest ways and means by which you can make your steel supply go further or cut your costs, Reliance engineers will be pleased to assist you in working out the details of application.

EATON

RELIANCE RINGS

MANUFACTURING COMPANY, RELIANCE DIVISION

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SALES OFFICES: NEW YORK • CLEVELAND • DETROIT • CHICAGO • ST. LOUIS
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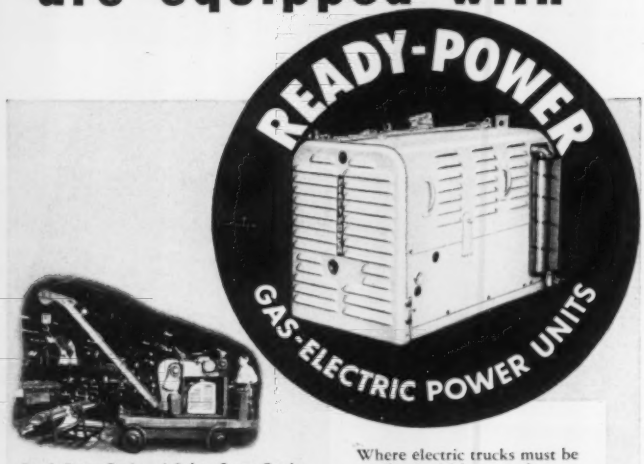
INDUSTRY'S BUSIEST ELECTRIC TRUCKS are equipped with



Ready-Power-Equipped Baker Crane Truck

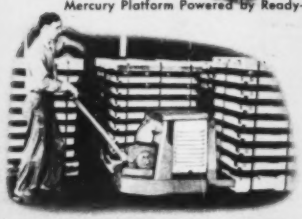
Where electric trucks must be on the go 24 hours a day . . . where full loads must be carried without interruption . . . Ready-Power meets every qualification.

Always dependable, always economical, Ready-Power Units generate *constant* power right on the truck chassis. Models for all sizes, types and makes of electric trucks.

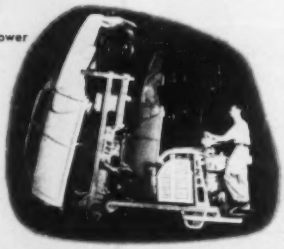
This Automatic Skylift Giant is Ready-Power Equipped

Mercury Platform Powered by Ready-Power

Ready-Power-Equipped Clark Fork-Lift



Yale Worksaver Pallet Truck with Ready-Power



Ready-Power-Equipped Elwell-Parker Truck

The READY-POWER Co.

3824 Grand River Ave., Detroit 8, Michigan

ety of conditions in size and complexity.

Developed originally seven years ago to supply users of the company's Chicago press brakes, today a large department supplies induction-hardened dies for all makes and sizes of press brakes. Performance is due to accurate control of both degree and depth of hardness over the die's entire length.

LaQue Talks on Corrosion

Distinction to be made between a material's corrodibility and protective value of its corrosive products was discussed by F. L. LaQue at a joint meeting of the Northern California District, ASTM, and San Francisco Bay Area Section, NACE, recently, at the San Francisco Engineers Club. Also covered was the manner in which these aspects are influenced by the material's composition and incidental conditions of its exposure. Mr. LaQue heads the corrosion engineering section of International Nickel Co.'s Development & Research Division, New York. He is also chairman of the advisory committee on corrosion, ASTM, and represents the society on the intersociety corrosion committee.

Tin Is Substitute Protector

Substituting a tinning application for bronze in rustproofing newell post points to be set in concrete saves A. Thordsen Ornamental Iron Works, Davenport, Iowa, about $1.15 per piece on each production run. Thordson, a hand rail manufacturer, uses the Kromover tinning pencil, made by All-State Welding Alloys Co. Inc., White Plains, N. Y., to get a surface that withstands corrosion tests up to 400 hours exposure to salt spray. Application takes 20 seconds and is done under forge heat remaining after newell post is drawn. This is compared with welder's average time of 12 minutes for each application when bronze was used.

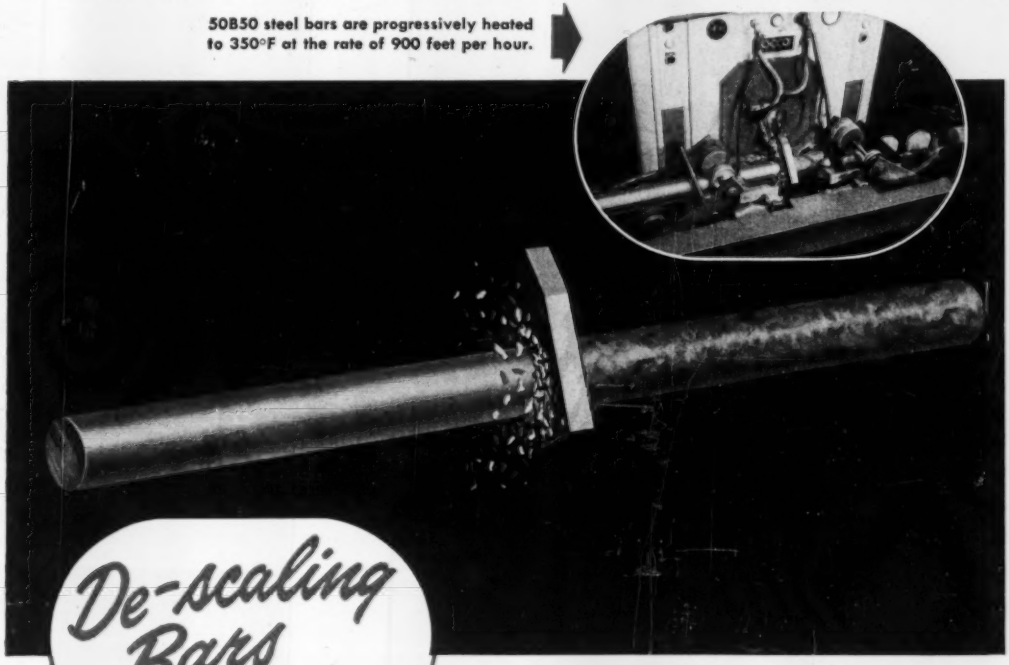
Forming Information Given

An illustrated folder on the Marform precision deep drawing process, developed as an outgrowth of the conventional low pressure rubber pad forming is available from Loewy Construction Co. Inc. The new technique combines the best features of the steel die with its accurate deep forming ability and the Guerin process with its economy in tooling. The new brochure describes process and equipment from technical and economical viewpoints.

Pictures of typical products, speci-

New Streamlined Production Technique That Saves Both Days and Dollars

50B50 steel bars are progressively heated to 350°F at the rate of 900 feet per hour.



De-scaling Bars with TOCCO* Induction Heating

THE PROBLEM—Axle shaft blanks for famous International Harvester farm tractors are normalized, hardened and drawn in conventional open-fired gas furnaces. Considerable scale is formed by these heating operations which, of course, must be removed. Formerly these heavy bars (85 lbs. each) had to be trucked to tumble mills for cleaning. This took time and money—over $7000 annually in labor costs alone, not counting heavy maintenance expense on the tumble mills.

THE SOLUTION—International Harvester engineers found that by using TOCCO* Induction Heating to raise bar surface temperature suddenly to 350°F the thermal shock removed the scale cleanly and completely. Bars are now *automatically* fed to descaling unit, *automatically* descaled by TOCCO, and *automatically* ejected onto pallets. The draw furnace operator merely "keeps his eye on" the descaling operation—no separate operator is needed—and best of all, expensive and time-wasting trucking to and from the tumble mills has been eliminated.

* If you have descaling, hardening, brazing, forging or melting operations in your plant, chances are TOCCO can save you time and money, too. Experienced TOCCO engineers are glad to work with you for similar cost-cutting results.

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Chrome Platers!

GET FASTER, BETTER PLATING RESULTS AT FAR LOWER COST

UDYLITE ELECTRO-CUPRALUM* ANODES

THE COPPER-CORE ANODE THAT COMBINES THE CONDUCTIVITY OF COPPER WITH THE CORROSION-RESISTANCE OF LEAD

Yes, sir—you'll get up to ten times the electrical conductivity with these sensational new anodes. Udylite Electro-Cupralum Anodes are made with a solid full-width copper core for greater current flow and covered with lead to resist the corrosive action of chromic acid solutions. The two metals are permanently sealed together by a Homogenous Extrusion process to prevent any current loss between the metals.

Consider all of the "plus" features which more than justify the higher initial cost of Electro-Cupralum Anodes:

1—Ten times greater conductivity.
2—Faster, more uniform plating.
3—Even distribution of current.
4—Permanent strength and rigidity.
5—No build-up of temperatures.
6—No cleaning of anodes required.
7—Long, trouble-free anode life.

Udylite offers Electro-Cupralum Anodes in a wide range of sizes and shapes, including tubular. Ask your Udylite Technical Man for detailed information, or write direct to The Udylite Corporation, Detroit 11, Michigan. There's no obligation.

*Name copyrighted by Knapp Mills, Inc., producers.

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

PIONEER OF A BETTER WAY IN PLATING

fications and cost analyses—in comparison with conventional methods—make the booklet a useful piece of literature.

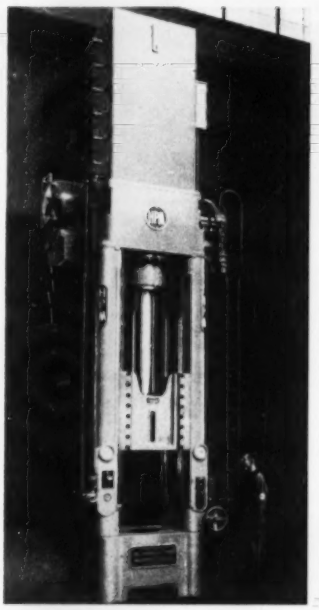
To receive a copy of folder L-58-606 write to Loewy Construction Co. Inc., 216 E. 49th St., New York 17.

Fastenings Stock Book Published

Publication of a price list and stock book, covering its complete line of nonferrous and stainless steel fastenings, is announced by H. M. Harper Co. Containing 56 pages, the book is of convenient size and is printed in three colors with every type of fastening shown in natural color.

An index page lists all fastenings by alloy and type for fast, easy reference. Included in the book-

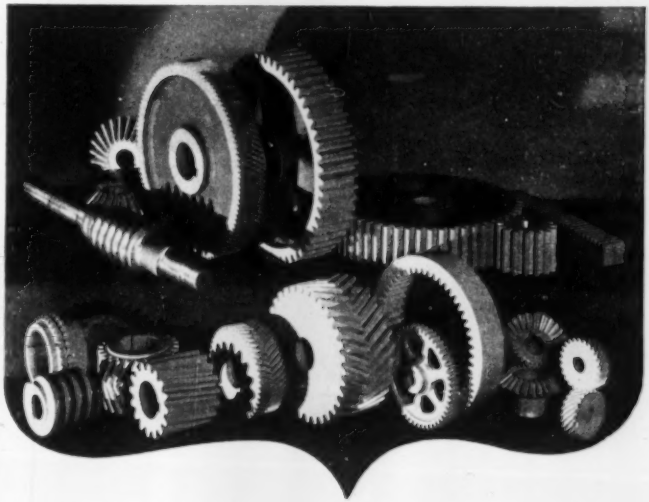
Ordnance Presses Move Along



CARTRIDGE cases to meet ordnance demands will flow in large volume from 80 all hydraulic, 150-ton, deep draw presses like the one shown above now being built by Hydraulic Press Mfg. Co., Mt. Gilead, O. This press is equipped with a 30 x 30-inch platen, has a 72-inch stroke and has an unusually high pressing speed of 215 inches per minute. It is powered by HPM's fast traverse system and also features high speed cycles with rapid advance to the work, automatic slow-down as die contacts work and rapid return for next cycle

INDUSTRIAL GEARS

for every purpose from an ounce to 20,000 lbs.

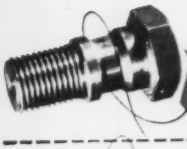


• Whether you require Spur, Spiral, Herringbone, Bevel, Mitre, Internal or Worm Gears—Worms or Non-Metallic Pinions... here they are... the finest made. For over a half century Horsburgh & Scott has specialized in making gears that represent the best in engineering design, accurate workmanship and fine materials. Economical too, for they are standardized and built to endure. With a complete line of all types and sizes . . . here's one source for all gears and gear products.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U. S. A.

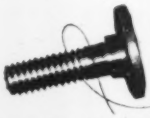
Send note on Company Letterhead for 488-Page Catalog 49

Faster production like this when you

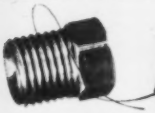


Production Increased 29%

Hourly Output Increased 49%
Tool Life Increased 25%

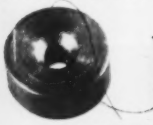


Production Increased 41.7%

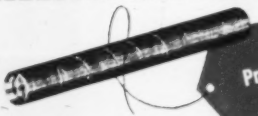


Production Increased 33⅓%

Production Increased 66%
Tool Life Increased 87%



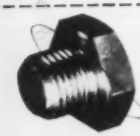
Production Increased 42.5%
Tool Life Increased 100%



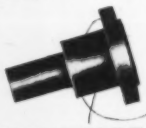
Production Increased 35%

Production Increased 50%

Production Increased 29%
Tool Life Increased 20%

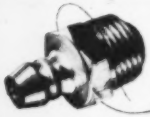


Daily Output Increased 19%
Tool Life Increased 39%



Tool Life Increased 200%

Production Increased 51%



Production Increased 17%
Tool Life Increased 50%

Production Increased 26%
Tool Life Increased Almost 100%

Production Increased 27%

Production Increased 55%
Tool Life Increased 30%

saves man-power...

do the job with MX

today's freer-cutting screw stock!

IN SHOPS where manufacturers of screw machine parts have switched from ordinary Bessemer screw stock to U·S·S Free-Machining MX, output per man, per machine, per hour has increased. The obvious results? Shop efficiency has jumped . . . unit costs have dropped.

The greater machinability of MX permits higher cutting speeds and longer periods between tool grinds. This is especially important today as the man-power pinch becomes increasingly acute.

Your man-shortage troubles are bound to become less pressing when you can increase your output 27%, 50%, or 66%; when your tools last two or three times as long—as on some of the typical MX-produced parts shown here.

Helpful, too, under present conditions is the fact that MX, because of its greater uniformity and better machinability, will permit you to turn out, *rapidly* and to close tolerances, the intricate and precise screw machine products now being called for.

And MX will cut their cost as well.

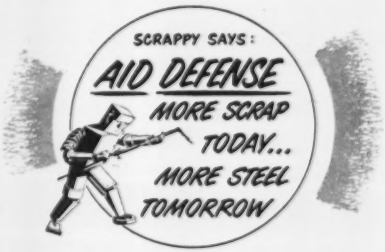
This is proved by the results obtained with MX to date. In producing many millions of parts of many different kinds, cost reductions have run as high as 42%. Usually the figure runs around 10 to 15%—but, without exception, cost savings have been recorded in every instance MX was given a thorough trial. That's why we feel safe in saying that MX will cut the cost of *any* part you now machine from ordinary Bessemer screw stock, even though MX costs a little more.

Give MX a thorough trial. Prove on your own machines that MX will reduce part cost by increasing production; will reduce machine down-time by prolonging tool life; will often eliminate extra finishing operations by assuring better part finish; will minimize rejections by providing closer dimensional accuracy.

U·S·S Free-Machining MX is being produced in all the popular screw stock sections and sizes. It is sold in cold-finished form by your regular supplier as "MX" or under his own identifying trade name. In hot-rolled form MX is available direct through our nearest district sales office.

Now, when production is more important than ever—

speed up the job and do it better with MX



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You can always give the
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• Wherever structural steel is used

Fort Pitt Bridge has long been known as steel builders for the "steel industry." Many of the important steel plants and steel plant expansion programs have been entrusted to this aggressive organization. Let Fort Pitt Bridge work with you on any contemplated program involving the fabrication and erection of structural steel.

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let are complete descriptions of all Harper Everlasting fastenings carried in stock in brass, bronze, copper, Monel, aluminum and stainless steel.

For free copy of this new fastening guide, write H. M. Harper Co., 8200 Lehigh Rd., Morton Grove, Ill.

Abrasive Cleaning Described

Airless Rotoblast room, a completely enclosed chamber where large castings are cleaned by streams of centrifugally hurled abrasives, is described in a four-page booklet published by Pangborn Corp., Hagerstown, Md. Information on abrasive reclamation and safety is included, and such features as the rotating table, controlled abrasive density and proper arrangement of cleaning jets are described and illustrated. A specification page gives front, side and floor plan drawings, plus data on wall construction, ventilation and light fixtures. To obtain copies, write to the company, requesting bulletin No. 222.

ASTE Readies Handbook on Dies

Metal-stamping dies will be classified according to accuracy specifications and production volume in a handbook being compiled by American Society of Tool Engineers' book committee. Plans for the handbook include an analysis of die components to develop principles of design, and a discussion of causes and elimination of die failures. In addition to die design, the publication will cover basic theory, die and work materials, press and setup data and safety. Frank W. Wilson, the society's book editor, is assembling material for the handbook. Mr. Wilson previously edited the *Tool Engineers Handbook*.

Ready Listing of Fastener Facts

A catalog compiling important fastener data for prospective purchasers and using a double tab index system is available from Russell, Burdsall & Ward Bolt & Nut Co. It describes all RB&W products: Bolts, nuts, cap and set screws, silicon bronze bolts and nuts, screw products, rivets and special products. Included are complete details on stock and nonstock sizes, dimensions, types, physical properties, prices, shipping weights, engineering data and useful tables on unified thread standards, terminology, abbreviations and decimal equivalents.

Any item can be found quickly by using the double-tab index. An identifying color tab indicates each product section (bolts, nuts, etc.), which, in turn, is further thumb-in-

How many men on a surgeon's team?

On the team we have in mind, more than you can count. And none of them is a doctor!

We're talking about the team that produced this surgical knife blade handle, made by the Christy Surgical Company of Cincinnati, and used by surgeons throughout the world. Both the surgeons who use it, and Christy who makes it have very definite ideas about the properties of the metal from which it's made.

Surgeons demand that it be strong, lest it bend or break. The manufacturer demands that it be easy to fabricate, machine readily, be easy to finish and polish and that its precision blade-slot wear well.

In the past these handles have been made from brass castings, wrought brass and stainless steel. None of these met *every* requirement. Now they're hot-forged from ANACONDA Nickel Silver.

We stress the fact that ANACONDA Nickel Silver was chosen because its superior forging qualities permit fabrication with progressive dies to the close tolerances demanded.

We should like you to know that, on any product you may make of ANACONDA Nickel Silver, Copper or other Copper Alloys, we are as concerned with suggesting the best manufacturing procedure as well as helping you develop the best product.

For technical assistance of any kind, or for a copy of Publication B-28 which provides detailed information on ANACONDA Metals and Metal Products, just write to The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

ANACONDA® – *the name to remember in* **NICKEL SILVER**

sheets • wire • rods • tubes

and special shapes

10,000 horsepower 12,000 r.p.m.

WHY DOESN'T IT FLY APART?

Magnaflux plays an important part in building safety into jet engines. With *every* part a critical part, it is essential that cracks and flaws be discovered *at time of production and throughout maintenance*, no matter how minute or well hidden.

That's why all jet engine manufacturers use Magnaflux to find hidden defects in metals—to show up cracks too small for the human eye to see. Magnaflux makes invisible cracks instantly visible, even when below the surface, in the making and maintenance of many products—from automobiles to locomotives, from sewing machines to sleeping cars!

Magnaflux is low in cost, nondestructive—*and so fast that it performs at production line speeds!* . . . For detailed information write for literature—how Magnaflux saves money and lives, described on request without obligation.

MAGNAFLUX

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DETECTS DEFECTS

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dexed by each product type (machine bolts, carriage bolts, etc.). Users of fasteners are invited to write for catalog No. 106 on their business letterhead to Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

Welding Competition Opens

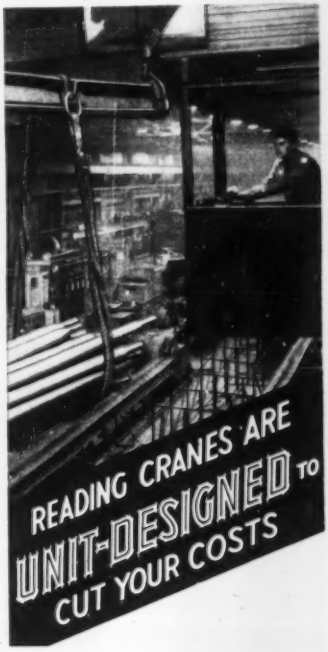
Rules and conditions for the annual competition of Lincoln Arc Welding Foundation's engineering undergraduate award and scholarship program are published in a twenty-four page illustrated booklet. Pictures of design and research projects described in award papers of previous competitions and brief descriptions of 1950 award papers are included with a bibliography of welding texts and references.

Program offers competition to encourage undergraduate engineers to use imagination and ingenuity in developing an engineering project in their own field. All registered undergraduate engineers are eligible. Awards totaling $6750 are made for best papers on design or separate components of machines or structures in which arc welding is the method of fabrication. Welding research and maintenance projects can also be described. Sixty-three awards range from $1000 to $25. Scholarship funds totaling $1750 are also awarded to schools for establishment of scholarships in honor of the main student awards. Rules booklets can be obtained by writing to James F. Lincoln Arc Welding Foundation, Cleveland.

Kirksite Die Warpage Eliminated

Warping and shirking of kirksite dies, long a serious problem in forming of aircraft parts, has been reduced by improved techniques developed by Armour Research Foundation, Illinois Institute of Technology, Chicago. A new method for casting constant tolerance forming dies, developed by Armour under contract to the Industrial Resources Division, Air Materiel Command, was shown to West Coast aircraft industry executives at the plant of Northrop Aircraft Inc., Hawthorne, Calif.

Many aircraft parts such as doors, engine covers, and fairings are made in metal kirksite dies formed by casting zinc alloys into sand molds. When the die cools and solidifies, it loses shape through warping and shrinking, requiring costly reworking termed barbering. Armour's method for producing close tolerance forming dies involves development of close tolerance patterns and methods of



When you have a READING CRANE installed in your plant, you get a crane CUSTOM-BUILT to meet your specific materials handling operation—at no added engineering cost!

Known as UNIT DESIGN, this unique method of crane construction reduces your costs in 2 ways.

1. LOWERS FIRST COST — Because READING CRANES offer you a choice of several interchangeable motor, control and hoisting units, you buy no "extras" to solve special handling problems.

2. REDUCES MAINTENANCE COSTS — All of the operating parts in a READING CRANE are easily accessible for overhaul or repair. The UNIT DESIGN feature makes it possible to remove any one unit without expensive "breaking down" of other units.

See your distributor for information on how you can get a READING CRANE "tailor made" to your own specifications. Drop us a line for your free copy of "The Why and How of Faster Production."

READING CRANE & HOIST CORPORATION

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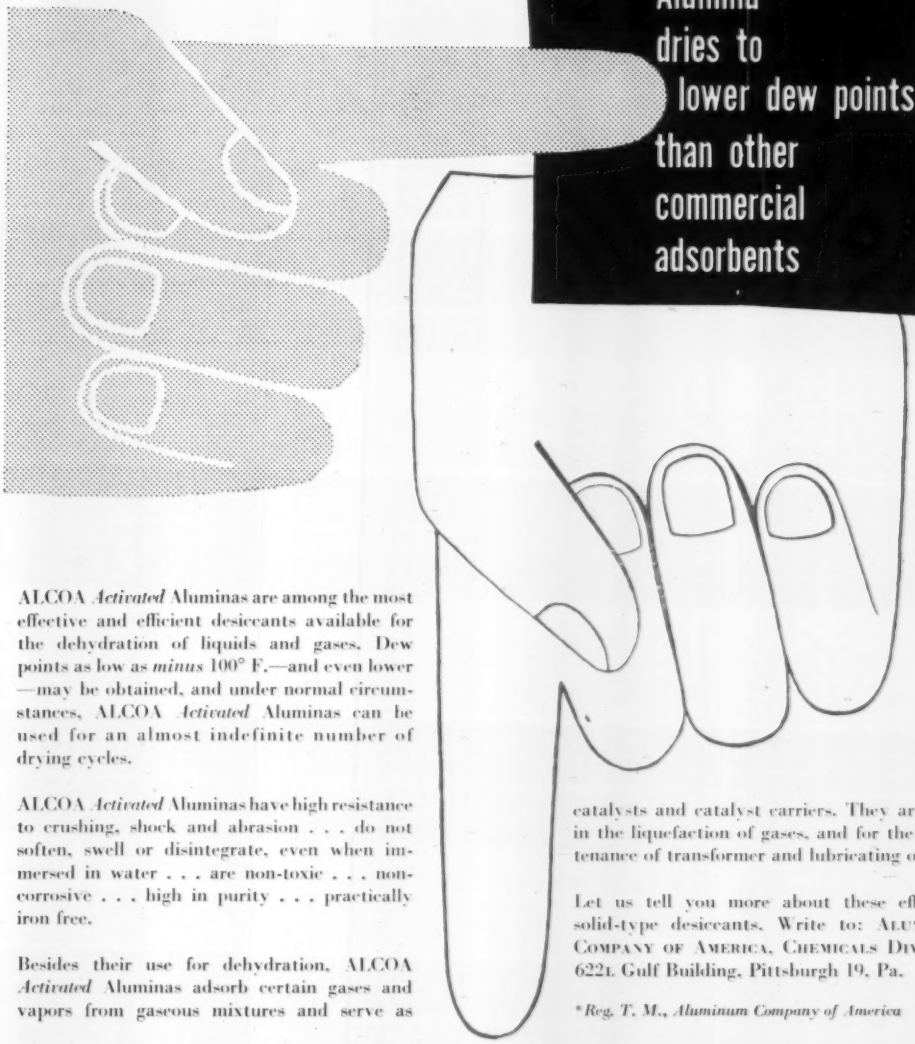
CHAIN HOISTS • ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES

READING CRANES

ALCOA Activated* Alumina dries to lower dew points than other commercial adsorbents



ALCOA *Activated* Aluminas are among the most effective and efficient desiccants available for the dehydration of liquids and gases. Dew points as low as *minus* 100° F.—and even lower—may be obtained, and under normal circumstances, ALCOA *Activated* Aluminas can be used for an almost indefinite number of drying cycles.

ALCOA *Activated* Aluminas have high resistance to crushing, shock and abrasion . . . do not soften, swell or disintegrate, even when immersed in water . . . are non-toxic . . . non-corrosive . . . high in purity . . . practically iron free.

Besides their use for dehydration, ALCOA *Activated* Aluminas adsorb certain gases and vapors from gaseous mixtures and serve as catalysts and catalyst carriers. They are used in the liquefaction of gases, and for the maintenance of transformer and lubricating oils.

Let us tell you more about these efficient, solid-type desiccants. Write to: ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 622L Gulf Building, Pittsburgh 19, Pa.

*Reg. T. M., *Aluminum Company of America*

Alcoa Chemicals

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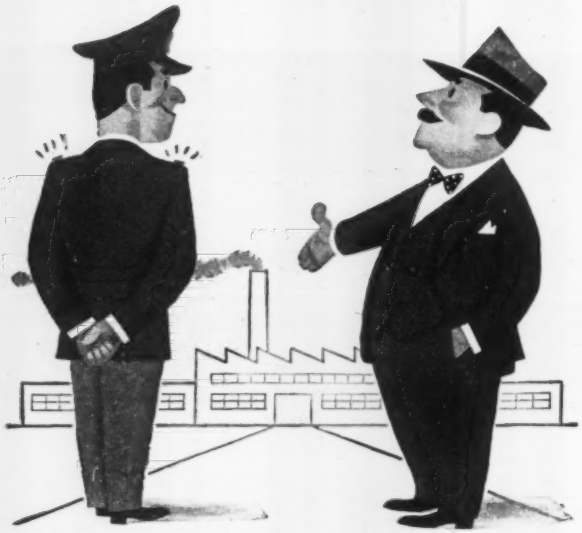
ACTIVATED ALUMINAS • CALCINED ALUMINAS • HYDRATED ALUMINAS • TABULAR ALUMINAS • LOW SODA ALUMINAS ALUMINUM FLUORIDE • SODIUM FLUORIDE • SODIUM ACID FLUORIDE • FLUOBORIC ACID • CRYOLITE • GALLIUM



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With today's extended delays in replacements, dollars mean less and less protection, when fire strikes. No chance of extensive cutbacks in vital production, loss of day-to-day revenue or decrease in customer good will, when your investment in materials, equipment and buildings is fully protected from the ravages of fire with efficient, quick-acting C-O-TWO Fire Protection Equipment.

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controlling solidification of the metal within the mold. At the Northrop demonstration the new method reduced shrinkage on a test die 1 x 6 feet and 10 inches deep from 0.110 inch per foot to 0.015 inch per foot. Barbering, the labor required to true up a conventional die after forming, was reduced 75 per cent.

Oxygen Affects Ladle Analysis

Effects of oxygen blown in a ladle of basic iron with high-silicon content has advantages and disadvantages according to P. Leroy, French Iron and Steel Research Institute, in a paper presented at the annual meeting of the French Institute of Metallurgy, Paris, Oct. 22-26.

The following results were obtained with a consumption of 4.5 cubic meters (158.92 cubic feet) of oxygen per ton: The silicon content was reduced about one-third, the manganese content by about one-fourth, phosphorous remained unchanged, the carbon content showed a negligible reduction, loss of iron about 1 per cent and an increase of temperature of 194° F. The sulphur content

Positioner Cuts Rebuilding Time

WORK POSITIONER and Unionmelt welding machine permit Alloy Hard-Facing Co., Minneapolis, to rebuild tractor rolls 8½ inches diameter in about 40 minutes for each face. Rolls are mounted on an axle and placed in a positioner that rotates approximately 30 inches per minute, operating on 300-325 amp at 25 v. Welder runs on a track above and parallel to the axle. Rebuilt surfaces have a Brinell hardness range of 200-275, reaching 325 after workhardening in use. Positioner and welder are made by Linde Air Products Co. Division, Union Carbide & Carbon Corp., New York

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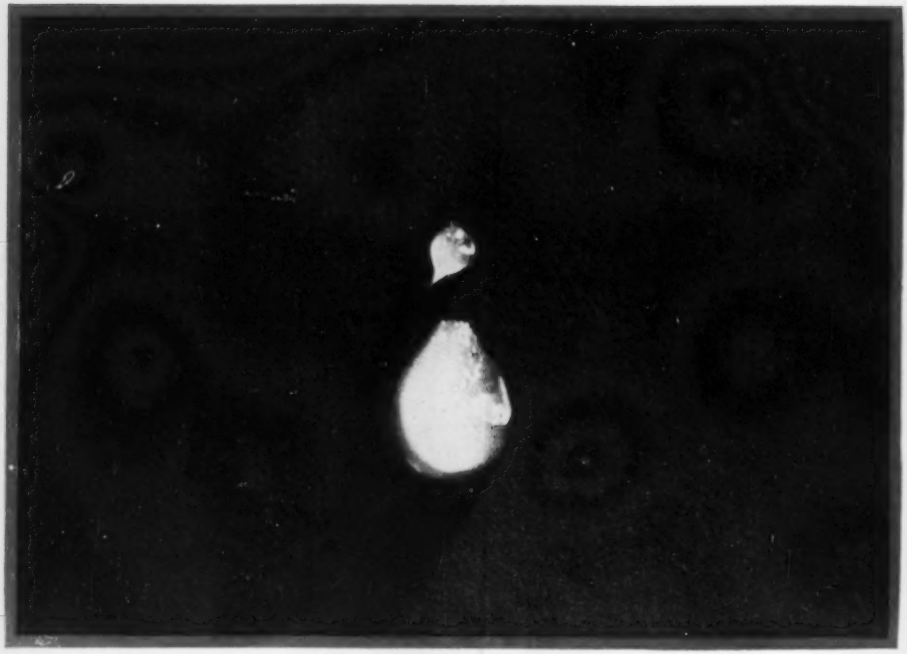

What Price . . . A Drop of Acid?

The price of a drop of acid is mighty small as long as you keep it in a carboy. But let it out — give it half a chance to get to your equipment — and it really can get expensive.

In metal finishing plants, particularly, chemical attack is a major problem — one that can cost plenty in "down time" and equipment replacement — one that can cause no end of headaches. But you can stop your troubles before they start — keep the cost of chemical fumes and spillage 'way down — with TYGON "Series TP" PAINT. Virtually all acids, alkalies, oils, and waters roll off a TYGON painted surface "like water off a duck's back".

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248C

And, here are some of the metal finishing chemicals that are "stopped" by TYGON: Sulfuric acid, hydrochloric acid, hydrofluoric acid, chromic acid, caustic soda, soda ash, trisodium phosphate, the cyanides, the halides, the sulfates, Rochelle salts, and organic acids.

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showed no increase with normal blast furnace slag but with sodium slag it was appreciably higher.

Research Volume Expanded

Research contracts in electronics, rocket fuels, nuclear energy, metallurgy, bio-mechanics, and air and water pollution problems have increased the annual research expenditures of New York University's Engineering Research Division to $1,040,000, a gain of 17 per cent over last year. These research activities are outlined in an annual report.

New contracts and extensions of contracts during the year amounted to $1,945,793, as compared with $924,024 last year. Some of this augmented volume was due to research of a military nature; much of it was a result of planned expansion of the division's research that is normally sponsored.

The division was established in 1944 to make available to government and industry the research talent, experience and facilities of NYU's college of engineering. Faculty members, full-time research engineers, and graduate students collaborate on the sponsored research. Forty-four technical specialists were added to the staff during the year, bringing the total personnel of the division to 305.

An outstanding development of the year was the rapid growth of electrical engineering research, especially in electronic measurement and antenna research. The division increased its emphasis on work on electron tube reliability problems, and extended its research on servomechanisms, stabilization, and control. The program in network theory and computers was strengthened. The long-term program of research on the fundamentals of jet propulsion engineering was supplemented by a recently initiated project under government sponsorship, dealing with the potentialities of various acetylenic compounds that may be used as rocket fuels.

An intensive program of study in fundamentals of Geiger counter construction is directed toward discovering what factors govern counter efficiency and reliability, as a basis for quantity manufacture of counters that will have predictable characteristics.

The division intensified its metallurgical research on titanium, perfecting its high-purity melting and electrolytic polishing techniques, and extending its investigations to a number of promising alloys. Research in methods of machining titanium was initiated.

Mill Gets Cathode Protection

There will be a minimum of underground corrosion of electrical lead sheathed cable, steel piping and structural steel to interfere with full-time production at U. S. Steel's new Fairless Works at Morrisville, Pa. To protect these metallic installations, bars of magnesium metal will be tied in electrically with them and also will be buried adjacent to the big buildings in which steel will be made and shaped for the eastern market. This new cathodic protection was designed especially by the company's research engineers and engineers of the construction engineering bureau after careful measurements, at Morrisville and in U. S. Steel's research and development laboratory, of soil and water samples that were obtained from the Fairless Works site.

Cable failures, burst pipes and weakened structures cause considerable damage to commercial and industrial installations each year. In an effort to prevent such corrosion losses at the new mill an exhaustive study was made of probable electro-

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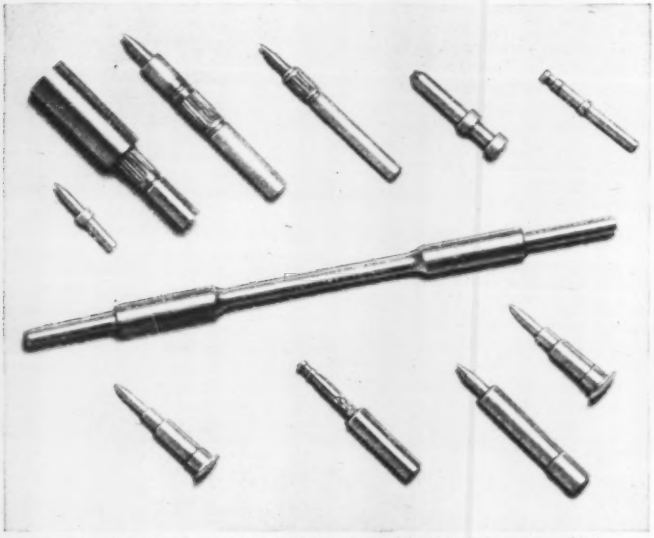


Examples of small parts produced accurately and economically on Swiss screw machines. Tapers on some parts generated on cutoff end to eliminate secondary machining operations. Courtesy Newtown Mfg. Co., Newtown, Conn. *(samples enlarged 35%)*

Taper Generated to Eliminate Secondary Machining Operation

Parts such as firing pins for fuses or electronic terminals with tapered points on one end, as well as operations on the opposite end, are often completed in the primary operation on Swiss screw machines. This is accomplished by generating the point on the cutoff end. Previously, this part was completed in a secondary operation.

In generating a taper, a single-point tool is used. The stock feed cam and the tool feed cam are synchronized to produce the required angle. Since the pressure of the single-point tool is almost negligible when compared to a broad-forming tool, distortion of the part is thereby reduced to a minimum, if not completely eliminated, and smoother finishes are obtained.

Unleaded Brass Used

The part in the lower right corner is a good example of such work. It is made from high brass rod (65% copper, 35% zinc) drawn to a spring temper. Without lead this alloy is generally not used in screw machines as the chip is long and stringy. However, the alloy and temper was used to obtain higher tensile strength and greater wearing qualities.

The overall length is .900 in. with one diameter .135 x 3 16 long, another .120 x $^1/_2$ and the tapered diameter .065 x 7 32. A .090 drilled hole is put in the .135 diameter.

Drill Edges Rounded Over

The cutting edges of the drill were rounded over to produce a negative rake, thus causing the chip to come out in a long, unbroken curl. In this way clogging by chips was eliminated and drill breakage reduced.

In rounding over the cutting edge of the small spiral drills, it was found that a diamond wheel produced a finer finish which decreased the friction and also produced a cleaner hole. Care must be taken to prevent burring of the cutting edge.

Carbide tools were used on all the parts and only standard twist drills were used rather than the flat gun drill.

The cutting compound used was a heavy sulfur-base oil. The work discolored but tarnish was removed by dipping.

The difficulty of centering accurately prior to drilling was overcome by using a fixed cutting tool from the overhead post. By accurately turning the center, the possibility of the drill walking and breaking was considerably reduced.

A spindle speed of 10,000 rpm was used with a feed of about 0.0009. For a better finish the feed can be reduced to around 0.0005.

Double Feed-Out Utilized

The length of the part in the center of the illustration theoretically was too great for the machine which matches the diameter of 5/32. However, by feeding twice without cutting off and supporting the work from the turret, it was possible to turn the three diameters, then cut off.

In cutting either leaded or unleaded copper-base alloys, no top rake was used and the clearance angles were between 5 and 10 degrees. High finishes were obtained by slightly breaking the edge of the cutting tools.

For information on the cutting characteristics of various alloys and information on machining them, write on company letterhead for Bridgeport Brass "Technical Handbook." If additional help is needed, contact our Laboratory. (7404)

CAUSES OF CORROSION

This article is one of a series of discussions by C. L. Bulow, corrosion metallurgist of the Bridgeport Brass Company.

DEZINCIFICATION CORROSION (Cont'd)

How Inhibitors Work

It has been shown that the addition of arsenic to brass definitely retards dezincification. Instead of red copper or a mixture of copper with cuprous oxide appearing on the surface, a very thin black or gray colored film, consisting of arsenic, arsenic trioxide, or a mixture of arsenic trioxide with cupric oxide or copper makes its appearance.

Holloman and Wulff[1] examined, by x-ray and electron diffraction methods, the black colored corrosion film developed on the corroding surfaces of arsenical 70-30 brass and antimonial 70-30 brass and concluded that brass containing approximately .03% or more of arsenic becomes coated with redeposited arsenic which is subsequently oxidized to arsenic trioxide. The mechanism is practically the same for antimonial brass.

The very thin arsenical film, which redeposits on arsenical brass during corrosion, finally reaches sufficient thickness to substantially change the potential of the brass so that it approximates that of copper. At this new potential, the force is insufficient to lead to the redeposition of copper by reduction of copper salts in solution on the surface of the corroding brass.

It should be noted that general corrosion of arsenical brass essentially proceeds at the same rate as that for copper as shown in the curves presented in the September and October issues of this column.

Since the redeposition of copper is prevented by a film of arsenic or antimony compound, it may be anticipated that any substance which can form films having similar characteristics should prevent redeposition of copper and, hence, should prevent dezincification. It is evident that a number of films can form under varying circumstances which can inhibit dezincification. This can be accomplished either through the addition of a dezincification inhibitor to the alloy or to the corrosive solution. The addition of the inhibitor to the alloy is generally more practical since the more effective inhibitors only need be added in concentration in the order of .02 up to .04% to effectively block the dezincification reaction. The addition of a dezincification inhibitor to the corroding solution generally is most feasible in a closed system which allows for more careful control of the inhibitor.

(1) J. H. Holloman and J. Wulff, Trans. Am. Inst. of Mining & Metallurgical Engineers, 143, 93-96 (1941).

New Publication Available

"Bridgeport Alloys—Properties and Uses"—new 4-page folder designed to help the metalworking industry and other fields to distinguish between copper base alloys. Lists 65 commonly used Bridgeport alloys, their composition, properties, forms and typical uses. Write to our Sales Promotion Service.

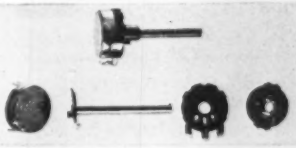
Brass Smooths Action of Resistor

Smooth action, ability to withstand wear and corrosion are essential in variable resistors used in electronic work.

Copper-base alloys answer these demands. The excellent machinability of free-cutting brass rod allows close tolerances to be held in producing the threaded guide bushing. At the same time, the leaded brass makes a good bearing surface for smooth action.

The bushing plate is leaded clock brass (62.25% copper, 2% lead and the remainder zinc). This alloy allows clean blanking and piercing and in hard temper it has a tensile strength better than 70,000 psi.

Other copper base alloy parts include the shaft, made from free-cutting brass rod; the spring contact terminals of phosphor bronze and the copper soldering terminal lugs.



Variable resistor and component parts, courtesy Clarostat Mfg. Co., Inc., Dover, N. H.

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

Tube Working Tools for service and maintenance of copper, brass and aluminum tubing are available singly or in sets. The line includes cutters, flaring tools, swedging tools, inner and outer reamers, refacing tools, pinch-off tools and benders. **No. 1187**

Punch Press Loader is said to increase speeds on redraw operations from 10 to 60% over hand feeding. Mechanical fingers pick up parts after first draw and feed redraw presses at speeds up to 1200 parts an hour. **No. 1188**

Electric Arc Drill is reported to facilitate speedy removal of broken taps, drills, reamers and studs. Using hollow copper alloy tube as an electrode, the device drills holes from 0.040 to 1 in. and larger in hardened dies, within 0.010 in. Since the electrode does not revolve, square and hexagonal holes can be produced. The completely self-contained unit has a 2-kva rating. **No. 1189**

Sheet Metal Tester determines the workability of material by determining the pressure required to fracture a sample. In operation, the test piece is clamped between two dies and held so the metal can flow. Then a rounded tool is advanced gradually by a hand wheel until fracture occurs. The unit can be supplied with gauges registering 0-30 cwt, 0-6 tons or 0-20 tons pressure. **No. 1190**

Drill Grinder is said to produce any angle of point from 90 to 160 degrees, and any clearance angle from 5 to 15 degrees on two-lip twist drills. It will accommodate sizes from No. 70 to $\frac{1}{4}$ in. with either tapered or straight shanks. **No. 1191**

Bar and Tube Straightener accommodates tubes from $4\frac{1}{2}$ in. to $16\frac{1}{2}$ in. and solid bars from $4\frac{1}{2}$ to 9 in. in diameter. Three rolls are used at entry end of machine, three more at the delivery end, and a middle idler roll is used to deflect pipe during straightening. Production speeds are said to range from 60 to 240 fpm, using a 200 hp, 300/1200 rpm direct current motor. **No. 1192**

Height Indicator is designed for toolroom, receiving, inspection and other operations requiring accurate height measurement from surface plate. Electronic gage head has dual 1000-2000 to 1 amplification, with the smallest graduation being 0.0001 in. Vertical capacity is 0 to 26 in., and throat capacity—from gaging point to edge of column rack—is $4\frac{1}{2}$ to 11 in. Adjustment knob provides maximum adjustment of 0.010 in. of gaging stylus. **No. 1193**

Bright-Dipping Solution is said to give metal a satin or matte finish, resistant to further oxidation or discoloration. Non-etching, non-toxic and non-fuming, the solution can be used on copper, brass, bronze, nickel, silver, phosphor bronze and most other copper-base alloys. It can be used at full strength at room temperature, in an acid resistant tank. Ventilation or special drains are not required. **No. 1194**

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Military Packaging Manual Out

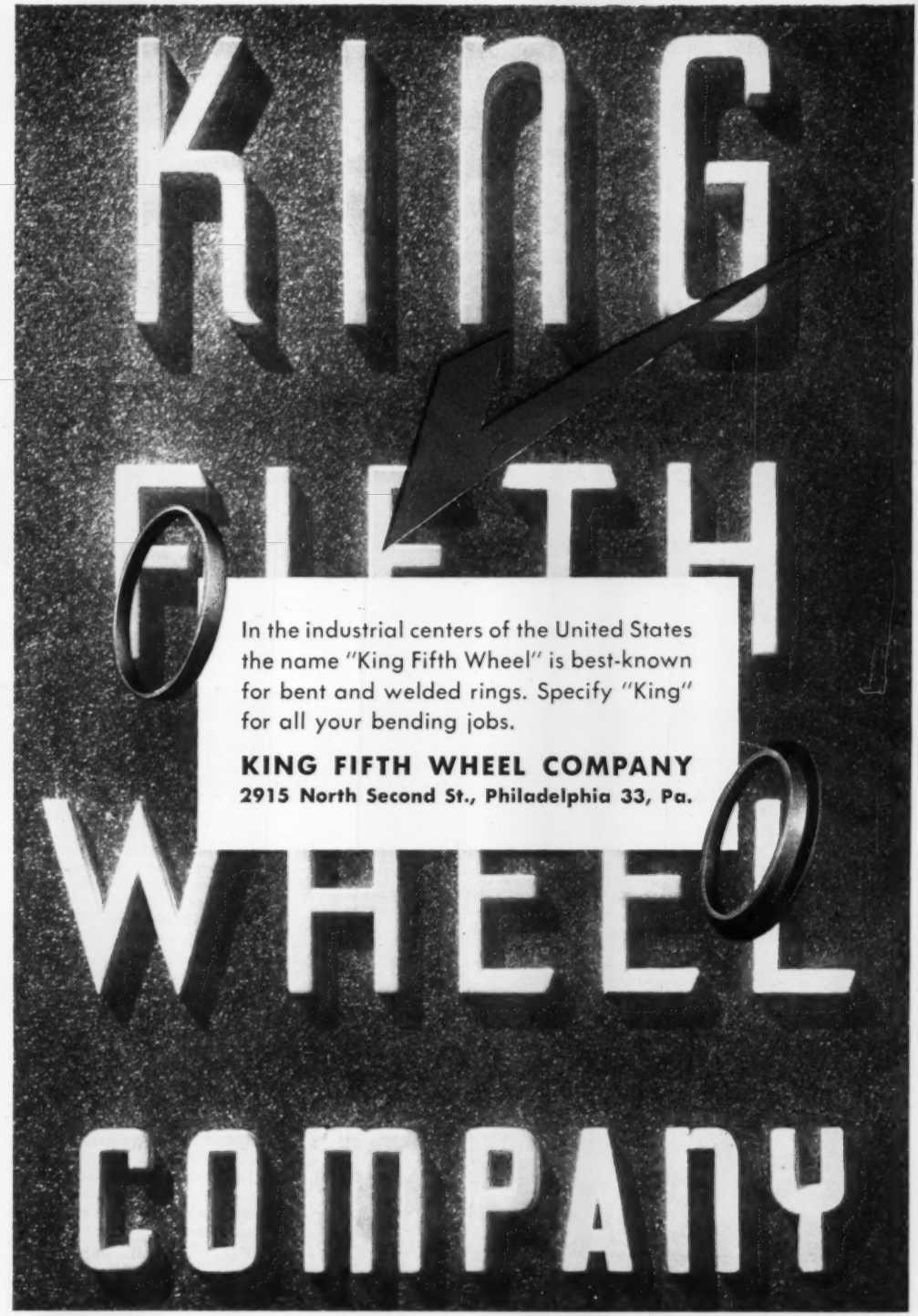
A manual on preserving, packaging and packing military supplies and equipment has been issued by the Department of Defense. It will be of material aid in reducing losses of stores because of inadequate or improper protective packaging, officials say. It will be available for use by industry in processing supplies and equipment, and covers in detail steps necessary to protect stores so they will get to their ultimate destination in a ready for issue condition.

The publication is jointly issued by the departments of the Army, Navy and Air Force and will be used by the three services to standardize preservation and packaging procedure among the military services. It also will be used as a textbook for students taking the Joint Military Packaging course given by the Rossford Ordnance Depot, Toledo, O., for the three services.

Copies of the manual may be obtained from the U. S. Government Printing Office, Superintendent of Documents, Washington 25, D. C. Requests should include the title, "Manual on Preservation, Packaging and Packing of Military Supplies and Equipment," and one of the following reference numbers: Department of the Army Technical Manual TM 38-230; Department of the Navy Manual NavExos p.938, or Department of the Air Force Manual AFM 71-1.

Movie Shows Foundry Practice

"Steel with a Thousand Qualities," and industrial motion picture covering many phases of modern steel foundry practice for making carbon, stainless and special alloy castings, has been released by Lebanon Steel Foundry, Lebanon, Pa. The 16-millimeter sound film in color runs 37 minutes; is available without charge to industrial and manufacturing groups, technical, engineering and scientific societies and educational institutions.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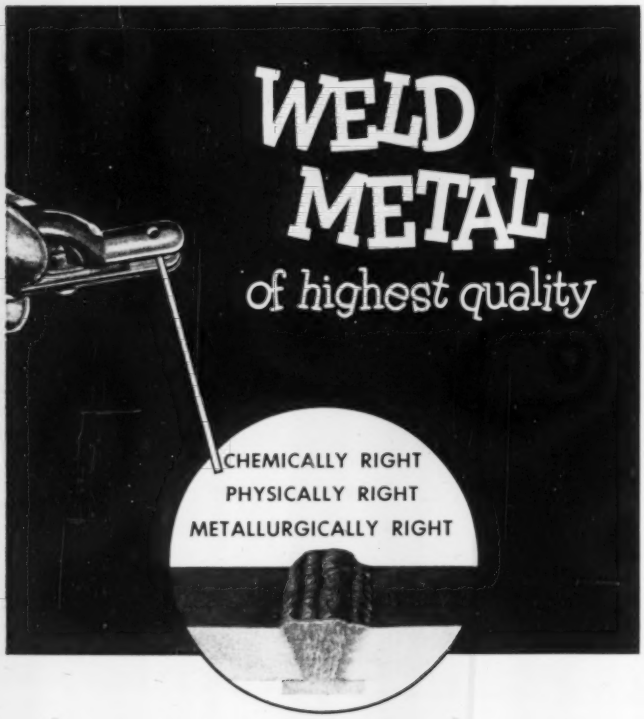

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New Books

Analysis of Industrial Wastes

Industrial Wastes, Their Conservation and Utilization, by Charles H. Lipsett; cloth, 317 pages, 6 x 9 inches; published by Atlas Publishing Co. Inc., New York, for $5.00; available from STEEL, Penton Bldg., Cleveland 13, O.

This semitechnical book is a comprehensive analysis of all the important industrial wastes and their vital role in the economic life of the country. It acquaints the reader with the principal scrap and waste materials that are produced and used by the industries. It also tells him their sources of supply, how and by whom they are produced, how they are bought and sold, how they are handled and processed so that they are again suitable for use in making other commodities.

Ranging over a wide field of essential wastes, the book covers plastics, chemicals, glass, metals, textiles, rubber, paper, leather, steel, wood, as well as organic wastes, paints, solvents, agricultural wastes, etc.

History of Seamless Tubing

The Seamless Story, by J. Perc Boore, manager, Baker Steel & Tube Co., Los Angeles; cloth, 285 pages, 6 x 9 inches; published by Commonwealth Press Inc., Los Angeles; available from STEEL, Penton Bldg., Cleveland 13, O.

The author spent more than three years in research work collecting the material on which this historical account of seamless steel tubing is based. It begins with the story of the Mannesmann and Stiefel piercing patent in Germany. Then the history of the seamless steel tube industry in the United States, including the story of Shelby Steel Tube Co., is told. A brief account of the individual tube companies that Shelby absorbed follows.

Brief history of these contemporary mills are given: Allegheny Ludlum Steel Corp., Babcock & Wilcox Tube Co., Detroit International Tube Co., Globe Steel Tubes Co., Jones & Laughlin Steel Corp., Michigan Seamless Tube Co., various plants of National Tube Co., Ohio Seamless Tube Co., Pittsburgh Steel Co., Spang Chalfant, Timken Roller Bearing Co., Tube Reducing Corp., Youngstown Sheet & Tube Co.

The story of the redraw mills tells the history of Ellwood Ivins Steel Tube Works, Columbia Steel & Shafting Co., Superior Tube Co., Pacific

Tube Co., Tube Methods Inc., Posen & Kline Tube Co., Kircher & Cloud Tube Works Inc., J. Bishop & Co., Agaloy Tubing Co., Plymouth Tube Co.

Biographical sketches included are Col. D. L. Cockley, S. L. Gabel, Ellwood Ivins, H. A. Lozier, Max Mannesmann, Reinhart Mannesmann, W. E. Miller, Col. A. A. Pope, R. C. Stiefel, F. M. Summerill, C. H. Wood.

The book is concluded with bibliography compiled by Victor S. Polansky of Carnegie Library of Pittsburgh. It lists the most important technical papers and patents which have appeared in the last 65 years.

Story of Herbert H. Dow

Herbert H. Dow: Pioneer in Creative Chemistry, by Murray Campbell and Harrison Hatton; cloth, 168 pages, 7 x 10 inches; published by Appleton-Century-Crofts Inc., New York, for $3.50; available from STEEL, Penton Bldg., Cleveland 13, O.

This is a biography of Herbert H. Dow, founder of the Dow Chemical Co. After graduating from Case Institute of Technology (then called Case School of Applied Science) he entered the rudimentary chemical industry by inventing an entirely new method of extracting bromine from the prehistoric brine trapped underground at Midland, Mich.

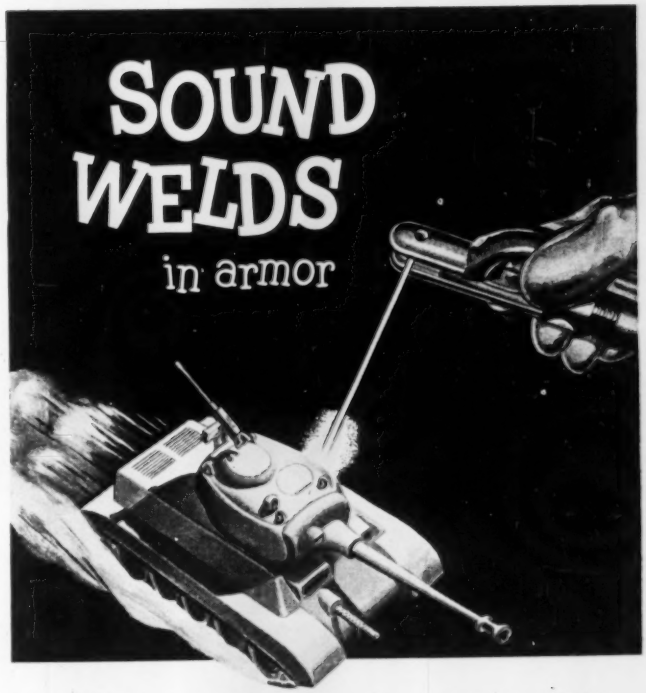
Working with borrowed money and homemade equipment of his own devising, Dow first manufactured bromides and later bleach. He developed a process to extract bromides from sea water, demonstrated in World War I how dependent a country is on its chemists and chemical plants, pioneered in synthetic rubber, and with his laboratory technicians developed many products of benefit to industry.

Spectroscopic Procedure

Experimental Spectroscopy, by Ralph A. Sawyer, professor of physics and dean of the Horace H. Rackham School of Graduate Studies, University of Michigan; cloth, 358 pages, 6 x 9 inches; published by Prentice-Hall Inc., New York; available from STEEL, Penton Bldg., Cleveland 13, O.

This book is written for students of spectroscopy and those in research laboratories who wish to make use of spectroscopic procedures. For this reason, extensive mathematical treatments have been avoided; a background of general physics and some physical optics should be sufficient.

Purpose of this second edition is to discuss prism and grating spectrographs and the techniques of their use in research. Primary emphasis has been placed on those principles and techniques that are fundamental



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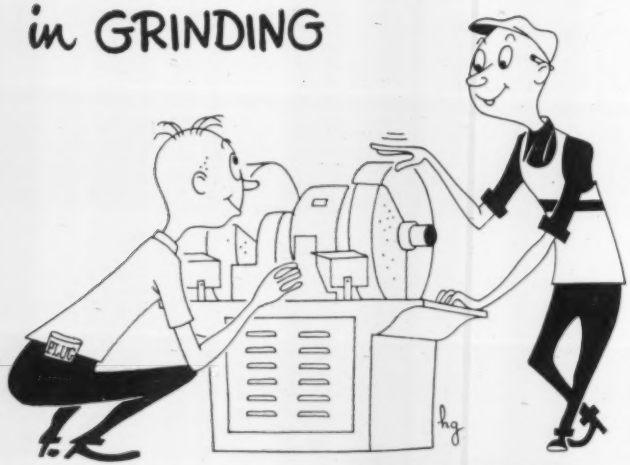

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Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

to practically all uses of spectroscopic equipment. Chapter headings are: History of Spectroscopy; Light Sources; Spectroscopic Apparatus—General Principles; Prism Spectroscopes and Spectrographs: Theory and Construction; Prism Spectroscopes and Spectrographs: Types and Use; Diffraction Grating: Theory and Production; Diffraction Grating: Mountings and Use; Photographic Process; Determination of Wave Length; Determination of Spectral Intensity; Apparatus and Methods of Infrared Spectroscopy; Spectroscopy of the Vacuum Ultraviolet, Spectrochemical Analysis.

References have been made to original sources and chapter bibliographs are given of some of the more useful works on each subject.

Pictures Structure of Metals

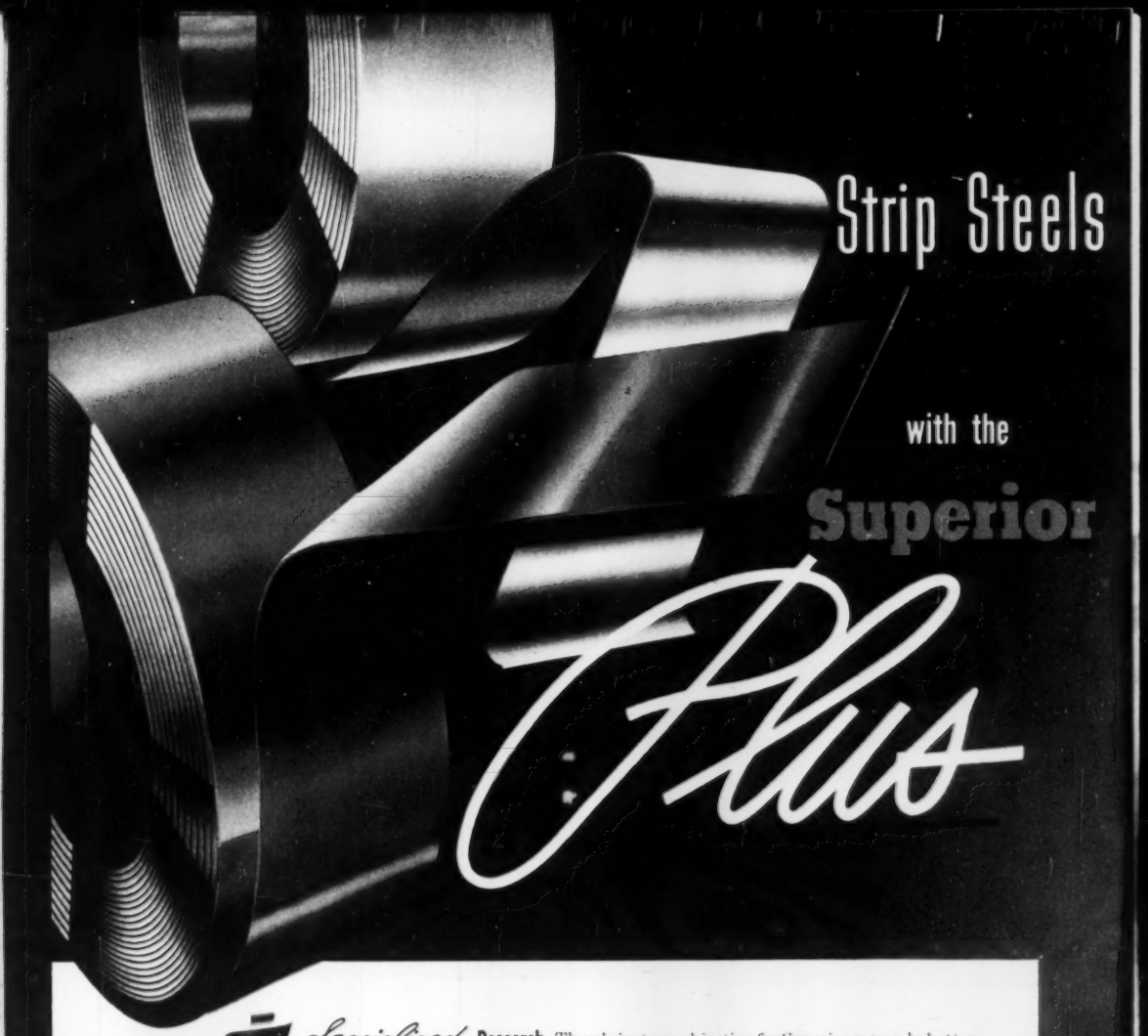
The Structure and Mechanical Properties of Metals, by Bruce Chalmers, professor of physical metallurgy, University of Toronto; cloth, 132 pages, 5 x 8½ inches; published by John Wiley & Sons Inc., New York, for $3:50; available from STEEL, Penton Bldg., Cleveland 13, O.

Object of this book is to provide the simplest possible picture of the structure of metals and alloys and its relation to mechanical properties. Although it is assumed that the reader has a general elementary background in physics and chemistry as well as a knowledge of terms commonly used in engineering, any resort to mathematical consideration is avoided.

In order to build up a working model of a metal, the author first shows how a pure metal is held together and the structures that may result from such forces. Effects of alloying elements on the structure are then discussed. Process of mechanical deformation is described and effects of both mechanical deformation and heat treatment on structure are considered. Structure of a particular sample of a metal or alloy is then considered in terms of the basic structure and the manner in which it is modified by treatment which has been applied. A brief and very general account is given of the ways in which the structure can be examined and determined. Finally, the more important mechanical properties are discussed and their dependence on the structure is illustrated.

Free Flow Pumps Described

Worthington Pump & Machinery Corp., Harrison, N. J., describes sump, sewage and drainage pumps in a catalog that include a cross-section drawing of the models. To obtain copies, address the manufacturer, requesting bulletin W-317-B12.



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Specialized **Research** There's just one objective for Superior research: better strip steels for the customer's. The results of keeping to this specialized subject are to be found in every coil of every grade of strip we manufacture . . . *continuously Superior.*

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Specialized **Superior Strip Steels:**

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SUVENEER® COPPER, MONEL, AND NICKEL CLAD METALS . . . ALLOYS,
SPRING STEELS, AND SPECIALTIES

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Over the years, [illegible] engineers have worked closely with engineers and designers in every field of industry. This co-operation, this *team-work*, has helped industry minimize friction in all types of equipment from the smallest motors to the largest blooming mills. Whether you are designing new equipment or looking for efficient, economical replacement bearings, look confidently to [illegible] for expert, proved advice. Depend on [illegible] to help you put the right bearing in the right place. 7270-B

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REASONS WHY **SKF** IS PREFERRED BY ALL INDUSTRY

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field service

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.—*manufacturers of* **SKF** *and* HESS-BRIGHT *bearings.*

CALENDAR
OF MEETINGS

November 26-December 1, Chemical Industries Exposition: Grand Central Palace, New York. Manager: Charles F. Roth, International Exposition Co., New York; chairman: E. R. Weidlein, Mellon Institute.

November 28-30, Scientific Apparatus Makers Association: Mid-year meeting, industrial, optical, aeronautical and military instrument sections, Hotel New Yorker, New York. Association address: 20 N. Wacker Drive, Chicago 6. Secretary: Kenneth Anderson.

November 28-30, Society for Experimental Stress Analysis: Annual fall meeting, Bellevue-Stratford Hotel, Philadelphia. Society address: Box 168, Central Sq. Station, Cambridge 39, Mass. Secretary: Professor W. M. Murray.

November 29, American Iron and Steel Institute: Regional technical meeting, Hotel Cleveland, Cleveland. Institute address: 350 Fifth Ave., New York. President: Walter S. Tower.

November 29-30, Annual Pittsburgh Diffraction Conference: Mellon Institute, Pittsburgh. Preliminary program information: C. W. Cline, Aluminum Research Laboratories, New Kensington, Pa.

December 5, Steel Kitchen Cabinet Manufacturers Association: First annual meeting, Hotel Cleveland, Cleveland. Association address: Engineers Bldg., Cleveland 14. Secretary: Arthur J. Tuscany.

December 6-8, American Institute of Mining & Metallurgical Engineers: Electric furnace steel conference, William Penn Hotel, Pittsburgh. Institute address: 29 W. 39th St., New York 18. Secretary: Edward H. Robie.

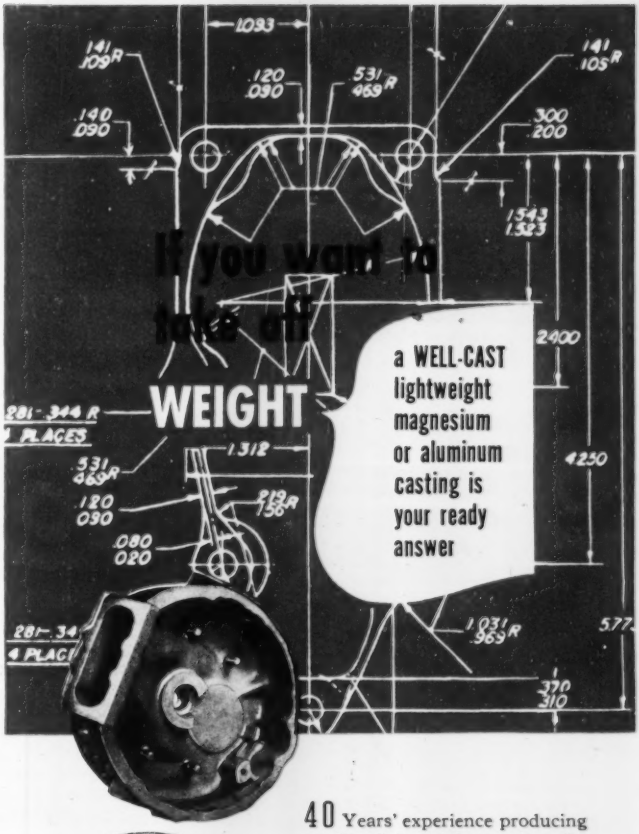
No Week-End Rust Hangover

Another application for vapor wrapper, rust inhibiting paper is advanced by Nox Rust Chemical Corp., Chicago. The company suggests storing unfinished ferrous parts in containers lined with its Callix-impregnated kraft paper when production stops at night or over the week-end.

For this temporary-type storage, a single sheet of wrapper is laid over the top of the box or bin and tacked, taped or simply weighted down to permit easy access when work resumes. Quick temporary storage practice prevents possibility of rust in the shut-down period, but eliminates time lost in applying and removing grease-type inhibitors that might otherwise be necessary.

Aircromatic Equipment Catalog

Aircomatic equipment and wires are described in a catalog published by Air Reduction Sales Co., New York. On-the-job illustrations showing types of application suitable for the equipment supplement photographs and sketches. The catalog includes descriptions of the company's wires for use with manual or automatic equipment, the manual operation gun, and automatic operation head. To get copies, request form ADC 717, from Air Reduction Co. Inc., 60 E. 42nd St., New York 17.



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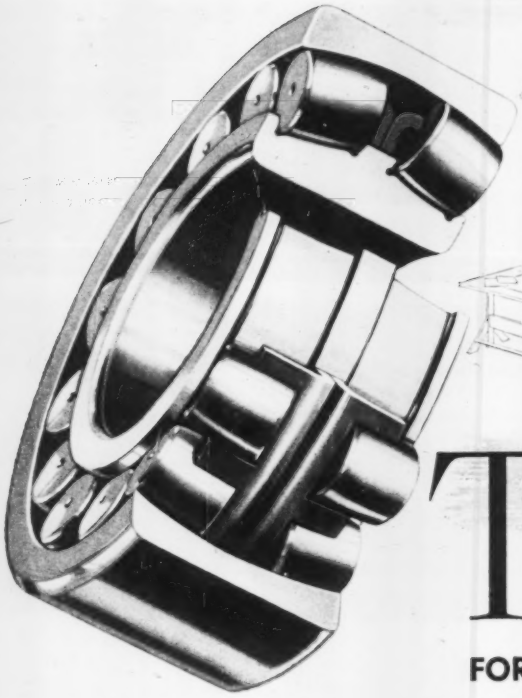

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Over the years, SKF engineers have worked closely with engineers and designers in every field of industry. This co-operation, this *team-work*, has helped industry minimize friction in all types of equipment from the smallest motors to the largest blooming mills. Whether you are designing new equipment or looking for efficient, economical replacement bearings, look confidently to SKF for expert, proved advice. Depend on SKF to help you put the right bearing in the right place.

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integrity • craftsmanship • metallurgy
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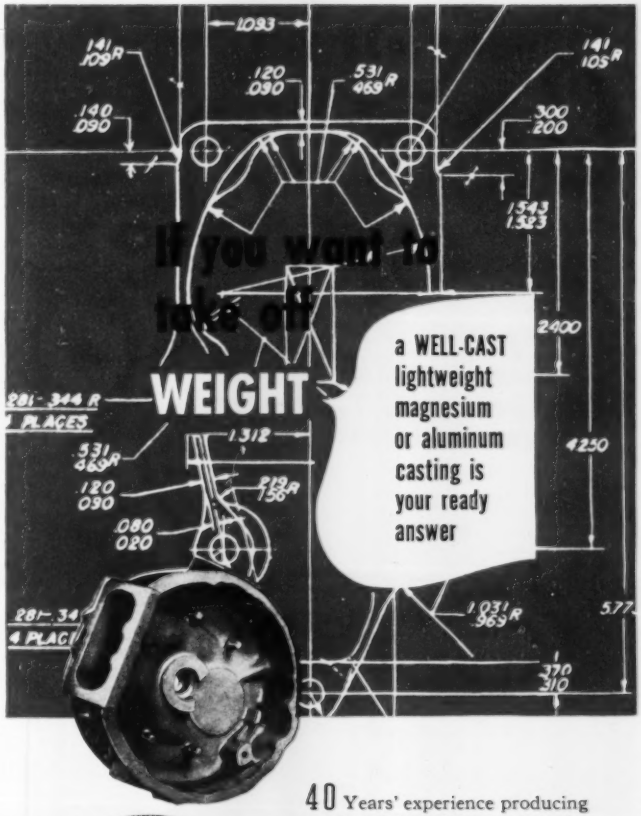

40 Years' experience producing quality lightweight castings for the aircraft, textile, pneumatic tool, automotive, domestic appliance, and other diversified industries everywhere.

Well-Made Wood and Metal Patterns
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Iron and Steel *need protection too!*

If it's made of iron or steel,
and exposed to the elements,
remember to have it
Hot-Dip Galvanized—*sealed in zinc!*

HANLON-GREGORY
Galvanizing Company

Pittsburgh . . . Pennsylvania

The World's Largest Job Galvanizing Plant

A. J. DIEBOLD, President

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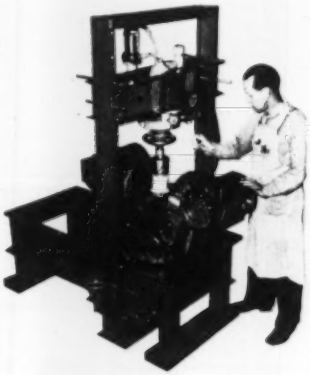
galvanizing . . . . pickling . . . . painting . . . . oiling

New Products and Equipment

Press Frame Is Movable

USE REPLY CARD—CIRCLE No. 1

Movable frame presses, designed by Dake Engine Co., Grand Haven, Mich., simplify pressing, bending, or straightening operations where parts are sufficiently large to require moving with overhead handling equipment. The company's line has a large area table on which work can be lowered by hoist or crane. After positioning, frame is moved over the table. Workhead can be moved from side to side along the frame channel, making it easy to center above the work laterally as well as longitudinally. Provision is made for workhead to be moved up or down to adjust to height of the work. Presses are available in standard capacities of 25, 50, 75 and 125 tons. They can be equipped for either electric or air-powered hydraulic operation.



. . . where parts require overhead spotting

Broaching Stator Rings

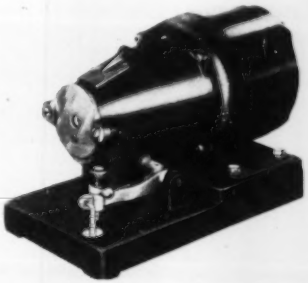
USE REPLY CARD—CIRCLE No. 2

Special fixture that accommodates all sizes of stator rings from 38 to 48 inches diameter, is offered by Lapointe Machine Tool Co., 144 Tower St., Hudson, Mass., for use on the company's conventional broaching machine. The fixture makes possible broaching of 40 to 100 slots in stator rings at a production speed of 35 seconds per slot. It is built with adjustable travel of 15 inches, hydraulic index, hydraulic plunger, and fully automatic lubrication. To obtain straight-line horizontal pull, an efficient and accurate broaching method for cutting slots in exceptionally large stator rings, the fixture is mounted on the company's horizontal HP-40, 20-ton, 90-inch stroke machine with conventional high speed return.

High Speed Wire Stripper

USE REPLY CARD—CIRCLE No. 3

High speed wire stripper, designed to put wire stripping on a production basis, is a development of High Speed Hammer Co. Inc., Rochester, N. Y. Its circular cutting knives instantly and completely remove insulation from solid, stranded or multiconductor cable up to $\frac{1}{2}$-inch diameter. Stripping length is adjustable to $1\frac{1}{2}$ inches. Motor is direct connected $\frac{1}{4}$ hp, 110 v. Cord, switch and plug are included as standard equipment and provide ready installation for any convenient outlet. Speed adjustments permit operation at stripping pace required.



. . . wire stripping on production basis

Trailer Carries Bagged Material

USE REPLY CARD—CIRCLE No. 4

All-steel medium duty trailer, designed by Market Forge Co., Everett, Mass., is suitable for handling bagged material or pallets loaded with bagged material. Smooth steel construction with rounded corners and edges prevents bags and other materials from being torn, eliminating a fault of many wooden trucks. Tubular racks at each end of the trailer are welded carefully to offer further protection against injury to material. These racks are removable. Diagonal coupler rods can be attached to loops on either side to permit backing with a tractor without "jackknifing." Trailer's capacity is 3000 pounds on a 69 x 36-inch deck. End racks are 23 inches high and deck is 14 inches from the floor.

. . . smooth edges prevent torn seams

REPLY CARDS

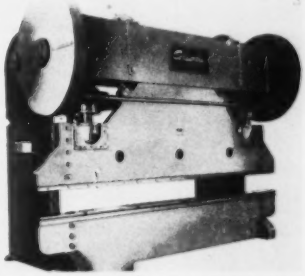
on page 159 will bring you more information on any new products and equipment in this section.

Press Brake Line Expanded

USE REPLY CARD—CIRCLE No. 5

Columbia Machinery & Engineering Corp., Hamilton, O., announces expansion and improvement of its power press brake line. The company offers a complete range of sizes at 120 to 1000 tons capacity for forming mild steel from 3/16 to 1-inch thick, 6 to 20 feet long. Design improvements incorporated on all models include a wedge-type pressure release developed for releasing the ram in event of bottoming of dies. Release device is a heavy steel wedge with top angle complementing a similar angle on the ram adjustment socket's base. Two cap screws secure its position. When screws are loosened, the wedge can be moved back to provide $\frac{1}{4}$-inch additional downward travel.

Models of 350 tons capacity have two-speed transmissions affording approximately 4 to 1 speed ratio. This equipment is optional on smaller



. . . introduces wedge-type pressure release

make your PUNCH PRESSES *Automatic*

It's Easy...with WITTEK Roll Feeds and Reel Stands

Wittek Roll Feeds handle any type of coiled strip stock and are made in single roll, double roll, and compound types with straighteners, in models to feed in any of four directions. They are reliable and accurate with simple, quick adjustment of feed length. Standard sizes and models meet a wide variety of press size and capacity conditions.

Wittek Reel Stands facilitate handling coiled stock.

**Write for full particulars*

WITTEK Manufacturing Co.
4328 W. 24th Place, Chicago 23, Illinois

Automatic ROLL FEEDS AND REEL STANDS WMCO

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FAST, LOW COST PRODUCTION

with **Wyckoff**

COLD FINISHED STEEL CARBON AND ALLOY

FEWER OPERATIONS

PRECISION DIMENSIONS, ACCURATE SHAPES AND DEPENDABLE FINISH AUTOMATICALLY GIVE YOUR END-PRODUCTS THESE DESIRABLE CHARACTERISTICS

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FIRST NATIONAL BANK BUILDING • PITTSBURGH 30, PA.
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Works at: Ambridge, Pa. · Chicago, Ill.
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4 CONVENIENT MILLS TO SERVE YOU!

models. Special throat depth, stroke and shunt height also can be furnished and all models can be equipped with air counterbalances and solenoid-actuated air-operated clutches.

Platform Low-Lift Truck

USE REPLY CARD—CIRCLE No. 6

Riding-type truck that speeds movement of skid platforms and skidded cases is added to the electric truckline made by Raymond Corp., 9184 Madison St., Greene, N. Y. Truck's capacity is 4000 pounds, its speed 5 mph loaded, 6 mph empty. The company's offset drive and stabilizing caster arrangement are included to ease operation in narrow hand truck

. . . moves skid platforms at 5 mph

aisles and permit turning at right angles from aisles narrower than the truck's overall length and load.

Available in three lowered heights —6, 9 or 11 inches—the unit has a standard 4-inch lift. Platforms are made in two widths, 18 and 24 inches, and in standard lengths of 30, 36, 42 and 48 inches. The truck is powered by the company's standard tractor, using a 12-v, 400-amp-hour battery.

Motor Made for Mill Use

USE REPLY CARD—CIRCLE No. 7

Heavy-duty, mill-type, flange-mounted down-coiler motor, made by Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa., operates under severe steel mill conditions. The motor is equipped with heavily reinforced flange mountings; heavy-duty, double-row ball bearings; and heavy cast brass mill-type brushholders. Totally-enclosed, its leads are brought out through packing glands and protected by heavy hose.

Slot wedges of class B materials replace bands in armature construc-

NEAT WAY TO BEAT A BOTTLENECK...

break it with RF HEATING

Here are facts that "talk turkey" to the alert businessman who must heat more metal products ***faster, cheaper, more efficiently.*** Take the production headache of the Whitney Chain Company, Hartford, Connecticut . . . now that was a tough one!

For years, Whitney used a lead-pot setup to anneal the ends of sprocket chain pins – hand dipping them ***one end at a time.*** Smashing this production bottleneck called for a reliable source of fast, efficient, selective heat. And they got just that with three Westinghouse 20 KW 450 KC RF units, each supplied with indexing ferris-wheel type work-handling equipment. Result . . . ***working only part-time, one operator can turn out 10 times the old production rate!*** What's more, RF Heating improved product quality, cut cost of production and material handling. All this with trouble-free operation.

If you're interested in production savings like these, send for our new booklet B-4782, "Induction Heating . . . The Machine Tool That Makes Tall Stories Come True." Call your Westinghouse representative or write to Westinghouse Electric Corporation, Dept. S-8, 2519 Wilkens Avenue, Baltimore 3, Maryland.

YOU CAN BE SURE...IF IT'S

Westinghouse

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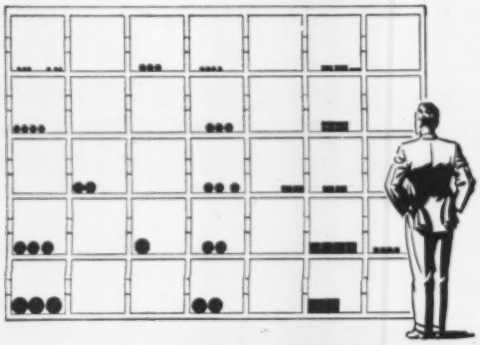
BILLETS AND FORGINGS FOR PRODUCTION, TOOL ROOM AND MAINTENANCE REQUIREMENTS.



The present serious **STEEL SHORTAGE** has reduced our warehouse stocks of HY-TEN and Standard alloy steels to a sub-normal level.

This inventory situation is, of course, very unsatisfactory but we are doing everything we possibly can to improve it.

Our aim is to allocate available stocks to our customers in the fairest and most equitable way possible.

Defense certifications on your warehouse orders will aid us greatly in supplying your alloy steel needs.

In the light of current conditions, we suggest that you put our metallurgical knowledge and experience to work for you.

It frequently happens that, when certain exact specifications are not available, our metallurgists can recommend entirely suitable substitute materials or alternate methods of manufacture and treatment.

Your nearby Wheelock, Lovejoy representative knows metallurgy. He stands ready to give you expert assistance in solving your problems.

Write today for your FREE COPY of the Wheelock, Lovejoy Data Book, indicating your title and company identification. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.

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Hillside, N. J. · Buffalo · Cincinnati

tion, and windings with class B insulation offer protection against hot spots resulting from high peak currents. Armature has low inertia for rapid acceleration and deceleration. Bolted-type commutator assembled on a steel bushing is used to extend life and ease maintenance. Motor's small diameter requires minimum mounting space; flanges are provided for mounting on any type of downcoiler.

Precision High Speed Lathes

USE REPLY CARD—CIRCLE No. 8

American Pullmax Co. Inc., 2627 N. Western Ave., Chicago 47, Ill., offers for U. S. sale the line of Koping high speed lathes. The line includes lathes in 4-inch increments from 16 to 40 inches. Among the model's design features is a disk type

. . . 40 feeds and threads; no gear change

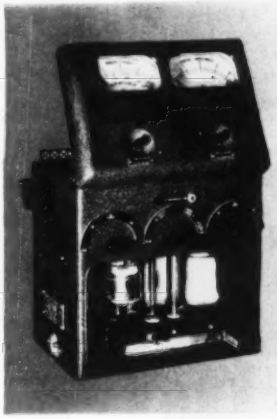
clutch for smooth forward and reverse power engaging. All shafts operate with roller bearings and a total of 18 different spindle speeds are available. Selection of 40 feeds and threads are available without change of gears. Movement of a tumbler and lever give direct readings for pitch, longitudinal and cross feed. Face plate operates behind a shield that protects operator from flying chips and cutting fluids. As many as 271 different threads in metric and American standards are possible.

Duct-Furnaces Conserve Heat

USE REPLY CARD—CIRCLE No. 9

A line of duct furnaces, designed for use in installations where air supply and pressure originate at a source removed from the unit, is announced by Automatic Gas Equipment Co., 530 Brushton Ave., Pittsburgh 21, Pa. Called Pittsburgh furnaces, they are used readily in air conditioning installations where air ducts are already in place. The basic unit is similar to the company's standard gas unit heaters in which durable cast iron heat exchanger and combustion chamber are provided to withstand corrosive effects of burning gases and

Not an instrument you buy... but a service we supply



Now *within seconds* you can get an accurate and complete picture of combustion conditions in your furnaces. A Cities Service Combustion Engineer, by applying his *exclusive* Heat Prover, will quickly secure continuous, accurate readings that reveal any oxygen excess or waste combustibles present.

Operators throughout the country, by using these instant readings as their guide, have been improving furnace output and product quality, while saving fuel.

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Company _____

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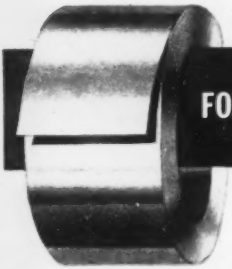


FOLLANSBEE COLD ROLLED STRIP

is custom-made steel suitable for innumerable products. It offers many time-saving advantages, too. It's a productioneer's tool—providing a continuous supply of uniform steel from coils to your automatics, regardless of forming operations involved.

Follansbee Cold Rolled Strip in coils is available in tempers and finishes to meet most specifications. Take advantage of Follansbee's custom-service. It's tailored to *your* metal-working requirements. Call the Follansbee Steel Representative near by and he'll tell you all about it.

FOLLANSBEE STEEL CORPORATION

SEAMLESS TERNE ROLL ROOFING • POLISHED BLUE SHEETS & COILS • COLD ROLLED STRIP

GENERAL OFFICES, PITTSBURGH 30, PA.

SALES OFFICES—NEW YORK, PHILADELPHIA, ROCHESTER, CLEVELAND, DETROIT, MILWAUKEE. **SALES AGENTS**—CHICAGO, INDIANAPOLIS, KANSAS CITY, NASHVILLE, LOS ANGELES, SAN FRANCISCO, SEATTLE, TORONTO AND MONTREAL, CANADA.

MILLS—FOLLANSBEE, W. VA. **FOLLANSBEE METAL WAREHOUSES**—PITTSBURGH, PA., ROCHESTER, N. Y., AND FAIRFIELD, CONN.

1475

moisture. Combustion chamber and heat exchanger are cast in one piece; extended heating surface fins are also cast integrally with the heat exchanger. Built-in draft hood absorbs all excessive chimney action, conserving heat as a result. Furnaces are supplied in sizes from 12,000 to 200,000 Btu input per hour. Controls and built-in draft diverter are standard equipment.

Scale Measures Force, Weight

USE REPLY CARD—CIRCLE No. 10

Completely pneumatic scale for either batch weighing or continuous process control is announced by Fluid Controls Co. Inc., 5150 Ridge Ave., Philadelphia 28, Pa. The device, called the air scale weight transmitter, converts accurately a variable force or weight into a measurable pneumatic signal. Its uses range from simple weighing operations to the more elaborate batch or continuous flow control of solids or liquids and jet engine torque and thrust measurements.

Scale balances out tare, allowing net weight to be indicated directly on standard panel board instruments. Operating on the force-balance principle, the weight transmitter indicates, records or controls weight or force through standard instruments in the manner commonly applied to temperature, flow, pressure and level problems. Elimination of all balance beams, knife edges and springs makes mechanism practically frictionless. Total movement is restricted to ⅛-inch including overtravel, thereby protecting components from mechanical damage.

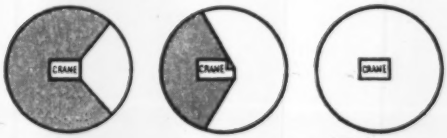
Winding Insulation Tester

USE REPLY CARD—CIRCLE No. 11

Low-impedance ac stator coil, dc armatures and series field coils are tested on a dc winding-insulation tester announced by Special Products Division, General Electric Co., Schenectady 5, N. Y. The device detects and aids in locating faults in turn-to-turn, coil-to-coil and winding-to-ground insulation in dc armatures of any size and rating. It is applied successfully in testing larger motors and generators, such as those used in railroad and steel industries.

Tester has a repeating type, surge-voltage generator that operates 60 times a second and a cathode-ray oscilloscope in a single cabinet. A fixture is provided for applying test voltage to the commutator of the armature being tested. Generator consists of an 0.5 microfarad capacitor, charged in one half cycle and discharged in the next. Capacitor's voltage is adjustable in 2 per cent

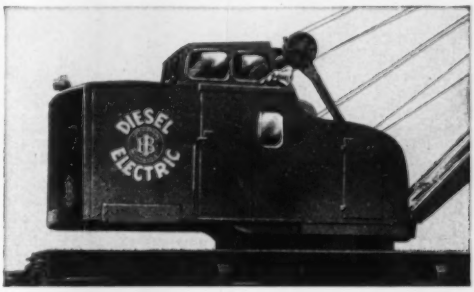
BROWNHOIST – THE ONLY LOCOMOTIVE-CRANE CAB THAT PROVIDES A CLEAR VIEW IN EVERY DIRECTION

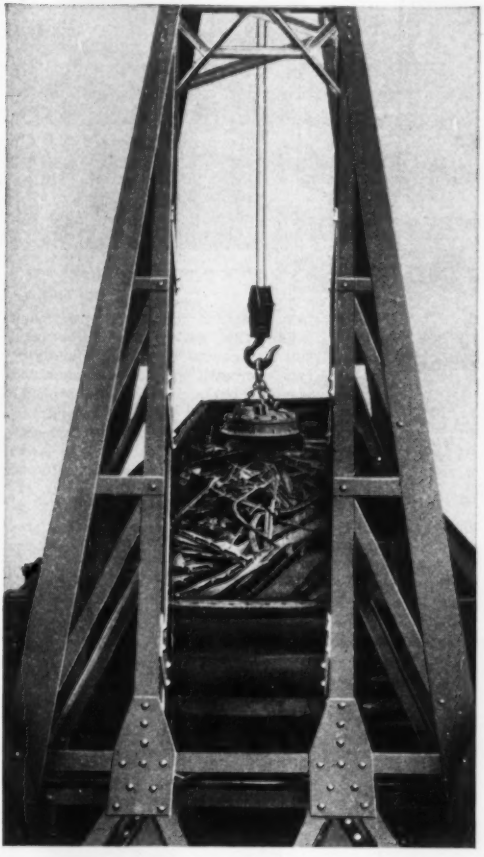


Approximate visibility from ordinary cab.

Approximate visibility with operator on side.

360 degree visibility from new Industrial Brownhoist Monitor-Type Cab.





Mounted high in the crane and surrounded by large windows, the operator in a Brownhoist patented Monitor-Type cab has full 360° visibility – forward, backward, and to both sides – providing safer operation, faster, more efficient loading and unloading. In addition the new Clear-Vision Boom is another Brownhoist feature that permits the operator an unobstructed view of his work. When unloading from high-walled railroad cars he can see right into the car.

The Monitor-Type cab is also designed for the safety and comfort of the operator. All controls are conveniently located and can be easily reached from a comfortable, well-raised seat. There's a soundproof partition between the operator and the machinery. There are doors on both sides of the cab and there's a 14" safety clearance between car body and rotating upperworks.

Brownhoist Diesel and Diesel Electric Locomotive-Cranes are available in capacities from 20 tons up for speeding materials handling with magnet, hook or bucket. Write today for complete information.

BROWNHOIST BUILDS BETTER CRANES

INDUSTRIAL BROWNHOIST CORPORATION, BAY CITY, MICHIGAN

DISTRICT OFFICES: New York, Philadelphia, Cleveland, San Francisco, Chicago, Canadian Brownhoist Ltd., Montreal, Quebec. **AGENCIES:** Detroit, Birmingham, Houston, Los Angeles. 148

steps up to a 7500-v peak by means of two tap switches and an auto-transformer. Unit is 20 inches wide, 30 inches deep, 48 inches high and weighs about 800 pounds.

Racks Handle Small Assemblies

USE REPLY CARD—CIRCLE No. 12

Coleman-Pettersen Corp., 2152 St. Clair Ave., Cleveland 14, O., introduces model 441 portable, heavy-duty materials handling rack. The model is designed to facilitate transporting and storage of small assemblies or parts on 12 removable trays in six rows 12 inches apart. The trays are 24 x 31 inches, suitable for use on standard roller and belt conveyors.

Racks are rolled easily on swivel caster type ball-bearing wheels that can be locked to hold units stationary for safe storage. Units have welded tubular frames; galvanized or painted finish is optional. Pivot type metal guards hold trays in position for safe transporting after receiving parts from machines or conveyors. For compact storage, trays are removed and racks folded flat. Trays can be fabricated from wire in any size expanded metal, wire mesh or sheet metal and supplied in any desired depth to accommodate various types of parts or assemblies.

Light Duty Band Tool

USE REPLY CARD—CIRCLE No. 13

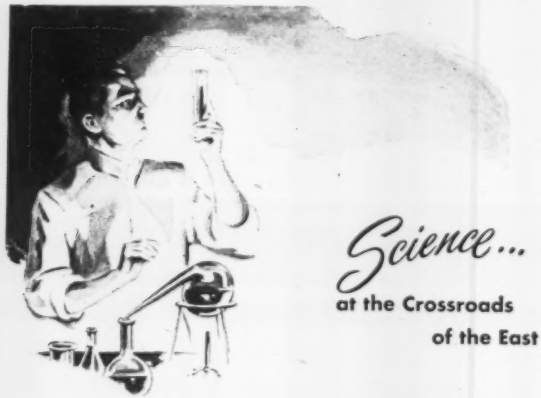
DoAll Co., Des Plaines, Ill., is offering a light-duty bandsawing-filing-polishing machine, designated SFP, that provides high and low tool speed ranges without changing belts, pulleys or motors. Its speed is infinitely variable by handwheel control and two-speed geared transmission from 50 to 300 fpm and from 860 to 5200 fpm. Machine includes a saw band welder that makes possible internal cutouts such as die openings and permits reproduction of special tools and machine parts. It also has the company's standard job selector dial and Speedmaster drive. Handwheel-controlled automatic power feed with pedal release is optional. Machine takes all standard saw bands to ½-inch wide, file bands ¼, ⅜ and ½-inch wide and ¾-inch polishing bands.

. . . permits reproduction of special tools

Recording Current Use

USE REPLY CARD—CIRCLE No. 14

TAG recording ammeter used portably with a clamp-ammeter unit, model 633 (type AIR-A2R), is offered by Tagliabue Instruments Division, Weston Electrical Instrument Corp., Newark, N. J. The combination measures and records alternating current without breaking the circuit. Its permanent record of current use and circuit reaction can be used to prevent wasted power and labor when applied to operations in



Science...

at the Crossroads of the East

Because almost every type of industry has been attracted to New Jersey, industry at the Crossroads of the East bears an outstanding mark of diversification and economic stability.

New Jersey is first in the country in the production of chemicals and allied products. It plays a leading role in the manufacture of apparel, petroleum products, electrical machinery, food, textiles and many other diversified items. Because of the construction of two basic steel rolling mills in New Jersey, even greater diversification will result among the members of the New Jersey industrial family.

Not only does New Jersey rate high in product diversification; it stands sixth in the value added by manufacture to produce finished products despite the fact that it ranks 45th in size in the nation.

Write for your copy of the new digest about New Jersey, "An Industrialist's View of the Crossroads of the East." Box C, Public Service, 76 Park Place, Newark, N. J.

PUBLIC SERVICE
ELECTRIC AND GAS COMPANY
NEWARK, N. J.

NEW JERSEY CROSSROADS of the EAST

in WIRE ROPE, too specialized use calls for the RIGHT KIND of muscle

Tough, wiry muscles stand the Rocky Mountain Bighorn in good stead; give him the sure-footed agility he must have to survive on almost impassable heights.

In wire rope, too, the right kind of muscle is mighty important... because different uses present different problems of wear and tear. Bending fatigue. Abrasion. Shock stress. Load strain. Each requires wire rope with the right construction and lay; the right grade of steel and size of wire to best withstand the destructive forces encountered.

Complete quality control from ore to finished rope; long experience and specialized know-how—these are your assurance that in Wickwire Rope you always get the proper combination of physical properties for long-lasting, reliable service on your particular job.

LOOK FOR THE YELLOW TRIANGLE ON THE REEL

THE COLORADO FUEL & IRON CORPORATION—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
THE CALIFORNIA WIRE CLOTH CORPORATION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New York • Philadelphia

WICKWIRE ROPE

CF&I

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL & IRON CORPORATION

For general-purpose motors and generators . . .

NATIONAL
TRADE-MARK

STANDARDIZED BRUSHES

For general-purpose motors and generators, such as widely used SK, CD and many other types, there are no better brushes than "National" STANDARDIZED Brushes and no better grades than NATIONAL CARBON's 255 and SA-35. Each brush has been well built for its specific job. Both grades, 255 and SA-35, have been proved dependable by many years of satisfactory service in leading mills. Here are the plus values:

- Unequalled uniformity
- Give most efficient machine operation
- Require minimum machine maintenance
- All at a *low flat price*, for one box or 10,000 boxes!

The term "National" and the Three Pyramids Device are registered trademarks of Union Carbide and Carbon Corporation

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A Division of Union Carbide and Carbon Corporation
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STANDARDIZED BRUSHES
FOR GENERAL-PURPOSE MOTORS AND GENERATORS

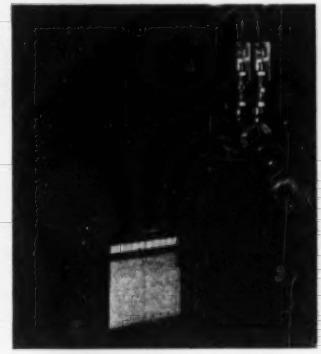
NC NUMBER	SPECIFICATIONS	APPLICATIONS
NC 12-3202	$1\frac{1}{4} \times 1 \times \frac{3}{8}$ Grade 255	Type SK Motors and Generators
NC 12-4001	$1\frac{3}{4} \times 1\frac{1}{4} \times \frac{3}{8}$ Grade 255	Type SK Motors and Generators
NC 20-4002	$1\frac{3}{4} \times 1\frac{1}{4} \times \frac{3}{8}$ Grade 255	Type SK Motors and Generators
NC 12-4003	$2 \times 1\frac{1}{2} \times \frac{3}{8}$ (15 15° bevel) Grade 255	Type CD Motors and Generators
NC 16-3205	$2 \times 1 \times \frac{1}{2}$ (15 15° bevel) Grade 255	Type CD Motors and Generators
NC 12-4802	$2\frac{1}{4} \times 1\frac{1}{2} \times \frac{3}{8}$ (35 20° bevel) Grade SA-35	Type CD Motors and Generators
NC 16-4804	$2\frac{1}{4} \times 1\frac{1}{2} \times \frac{1}{2}$ (35 20° bevel) Grade SA-35	Type CD Motors and Generators

Order by NC Number

FOR COMPLETE INFORMATION on NATIONAL CARBON'S brush standardization program and the advantages it offers, write to National Carbon Company, A Division of Union Carbide and Carbon Corporation, Dept. ST.

manufacturing or processing plants. Unit functions on the magnetic induction principle to make measurements on either insulated or non-insulated conductors.

Induced alternating current is rectified into direct current and supplied to the recording ammeter. When used on commercial sine wave



. . . checks on wasted power, labor

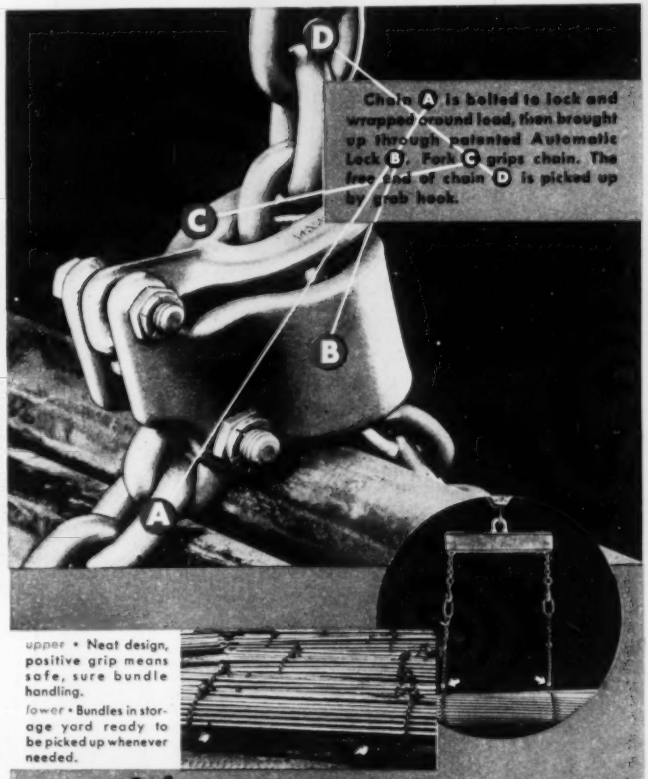
with frequencies between 50 and 70 cycles, instrument is accurate within 3 per cent. Influence of temperature changes from 32° to 110° F affects its accuracy less than 1 per cent. For permanent installation the recorder is used with the company's model 9921 rectifier converter and current transformer model 604, type 2.

Fluorescence Analysis Unit

USE REPLY CARD—CIRCLE No. 15

Design improvements in the Norelco fluorescence analysis unit that facilitate rapid qualitative and quantitative constituent analysis are announced by Research & Control Instruments Division, North American Philips Co. Inc., 750 S. Fulton Ave., Mount Vernon, N. Y. Unit has a wide range vertical goniometer with a sweep radius of 170 mm, replacing the horizontal assembly used on previous models. Equipment utilizes a horizontal, water-cooled oil-insulated x-ray tube operated from the company's standard water-cooled diffraction unit.

Output of the volume-sensitive Geiger counter is processed in electronic circuits, driving a strip chart recorder or count register. Chart instrument is used for normal qualitative and quantitative analysis and register is employed where extreme quantitative precision is required. Analyzer operates at potentials to 50



Chain A is bolted to lock and wrapped around load, then brought up through patented Automatic Lock B. Fork C grips chain. The free end of chain D is picked up by grab hook.

upper • Neat design, positive grip means safe, sure bundle handling.

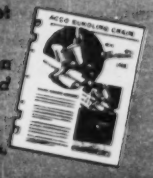
lower • Bundles in storage yard ready to be picked up whenever needed.

New AMERICAN
BUNDLING CHAIN
with Automatic Lock

A complete unit...ready to use. Eliminates links, shackles, pins, wires. Depending on the type of service and use, the drop-forged Automatic Lock can be furnished with 17/32", 9/16", 5/8", and 21/32" wrought iron, low carbon, high test, or alloy chain.

Speeds Material Handling. Bundles can be made up quicker, handled faster and safer, and stored indefinitely without loosening. Bundle is opened by flipping locking fork back by hand while load is suspended. When bundle is set down, chain runs back through lock body.

Write today for Bulletin DH-266 on the ACCO Bundling Chain with drop-forged Automatic Lock (Patent Pending).



ACCO
York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

Airco Heliwelding process slashes costs...

EASILY JOINS THE "HARD-TO-WELD METALS"

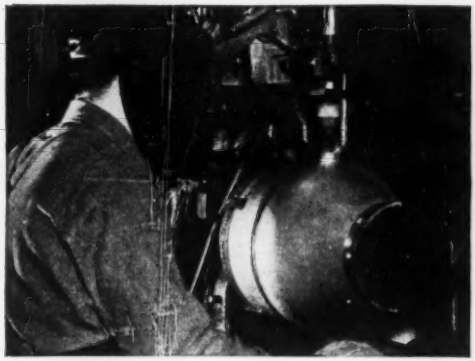
Heliwelding is one of Airco's inert, gas-shielded, arc-welding processes that permits all-position welding of aluminum, magnesium, stainless steel, brass and copper.

Particularly in the lighter sections of these materials, this time-tested, easy-to-use process has proved most economical. Older methods generally require use of fluxes . . . but the envelope of inert gas that shields the weld eliminates the need for flux . . . no slag is formed, thus permitting the operator a clear view of the puddle resulting in welds that are of unexcelled quality with such smooth contours that finishing is reduced to a minimum. This means savings in time, trouble and money.

Furthermore, Heliwelding's special characteristics—the complete gas shielding of a non-consumable electrode—provide a highly efficient and concentrated arc, which, in turn, permits welding at exceptionally high speed.

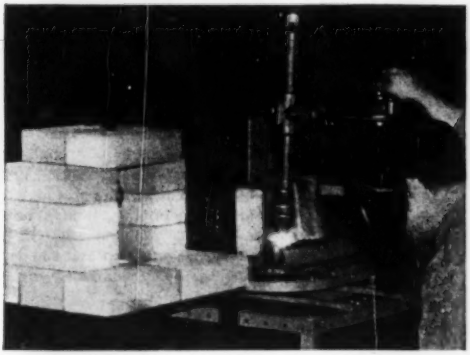
Another outstanding feature of Heliwelding is its minimization of distortion. This is due to its high speed operation with a small diameter electrode. Heat is concentrated to a pin point and moved rapidly along the work . . . thin sections are easily joined and protected by the fact that such a small amount of weld metal is required.

The case studies shown on these pages give you some idea how this exceptional process could help you. While the facts may be startling, they could very easily be applied in your own shop . . . but find out for sure. Write . . . or phone your nearby Airco office. Ask for a copy of ADC-709: "Heliwelding – Catalog 9".

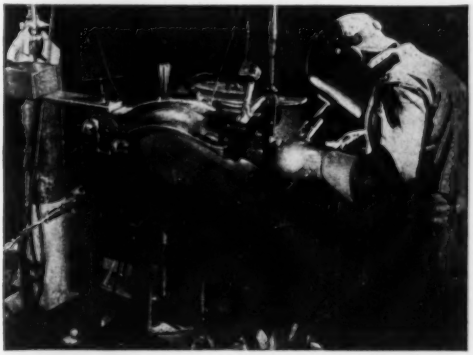


CUTS TIME AND MONEY COSTS . . . Hinman Milking Machine Company of Oneida, N. Y., found Heliwelding's ability to join stainless steel without a flux ideally suited to the fabrication of pails to be sold in conjunction with their milking machines. Top quality pails were produced quickly and easily; machine finishing was virtually eliminated and polishing reduced to a minimum — tidy savings of money . . . and time.

BUILDS A BETTER PRODUCT . . . Ducate Brothers, of Little Ferry, N. J., used Heliwelding to speed production and save cost in the fabrication of copper tanks for hot water heaters. They found this outstanding process extremely fast — and resulting in smooth, high-type welds greatly increasing the quality of the finished product.



PERMITS MECHANIZED MASS-PRODUCTION . . . Salkover Metal Processing Corp., of Long Island City, N. Y., adapted Heliwelding for mass-producing copper rotors for induction motors. Immediately production jumped to a new high, and costs dropped. Furthermore, Heliwelding permitted complete control of all operating variables — resulting in finer welds, with a minimum of rejects.



ELIMINATES DISTORTION . . . A prominent automobile manufacturer found Heliwelding most practical, both from a speed and finishing standpoint. Operating at 13″ per minute, Heliwelding produced a weld metal free from porosity and pinholes — distortion and splitting were completely eliminated on the .042″ sheet metal used to produce fender and similar assemblies.

AIRCO

AIR REDUCTION

AIR REDUCTION SALES COMPANY • AIR REDUCTION MAGNOLIA COMPANY
AIR REDUCTION PACIFIC COMPANY
REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL
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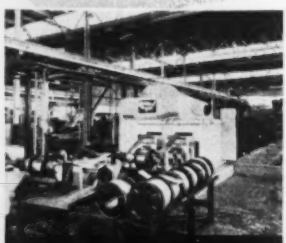
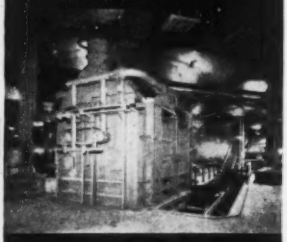
The over-all job in

Production Lines and Special Automatic Machines *by* **CONTINENTAL**

for military production...

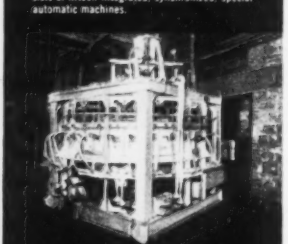


Continental Automatic Strip Production Line consisting of annealer, pickling machine, dryer, and coiler.



Continental Special Automatic Pig Molding Machine complete with automatic charging, melting, and pouring.

Continental Automatic Production Line operating from raw materials to completely finished and packed product. This production line consists of fifteen integrated, synchronized, special automatic machines.



Continental Special Automatic Glazing Machine complete with automatic press synchronizer and fire polisher.

For maximum production of military items manual operations must be eliminated. With CONTINENTAL Special Automatic Machines and Integrated Production Lines production goes on in a continuous flow with better, more uniform products with a minimum of man hours.

CONTINENTAL jobs begin with analysis of the requirements, then the selection and development of proper methods for greatest results. Finally follows the design, the building, and the installation of the machines—delivering a COMPLETE UNITIZED PRODUCING PACKAGE with results guaranteed.

The broad experience of CONTINENTAL offers you a prompt, sure solution to your change-over program.

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SPECIAL MACHINES
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MANUFACTURERS—ENGINEERS—CONTRACTORS FOR OVER A QUARTER OF A CENTURY

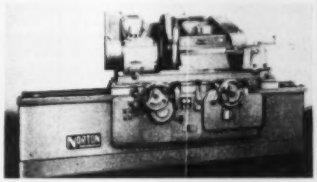
kv and at current values to 50 milliampere.

Machine Grinds Light Work

USE REPLY CARD—CIRCLE No. 16

Cylindrical grinding machine made by Norton Co., Worcester 6, Mass., takes light work requiring up to 18-inch swing. Known as type LCTU, grinder is offered in six work lengths from 18 to 120 inches; is available as a plain or a semiautomatic machine. Features designed to produce work rapidly and accurately and simplify operations include pre-set truing and grinding speed, click-count wheel feed indexing, automatic work rotation and coolant flow control.

Wheel spindle unit is the company's standard design. Long full bearings



. . . in work lengths from 18 to 120 inches

enclose a major portion of the spindle to keep it on a fixed center line under any condition of load and enhance its proficiency for roughing jobs. Maintenance functions are eased by electrical controls mounted for stand-up servicing, pumps and motors installed outside the base, a coolant clean-out ramp and ribbon-type steel base way guards.

Dry Scrubber Purifier

USE REPLY CARD—CIRCLE No. 17

Dry scrubber purifier with two-stage separation designed for use where extremely high quality vapor is required, is announced by Centrifix Corp., 3608 Payne Ave., Cleveland 14, O. Capable of delivering vapor containing 1.0 parts per million total solids or less, it provides internal upflow operation in pressure vessels such as steam drums and eliminates the need for auxiliary baffles within the drum. Rectangular-shaped antiturbulence shield effects primary stage separation, blocking direct contact of turbulent liquids and spray with secondary separation chamber. Secondary separation is accomplished by either upflow or downflow purifiers within the antiturbulence shield. Purifier's centrifugal and centripetal forces achieve separation efficiencies of 99.9 per cent. Purifier

Quality control...

another feature of Accurate service

A portion of the elaborate quality control equipment in use at Accurate.

. . . and it lowers *the overall cost of your springs*

THE uniformly high quality of Accurate springs . . . their rigid adherence to the customers specifications . . . are the natural result of the combination of skilled springmakers and the most modern springmaking machines *plus* painstaking quality control procedures. Quality control is just one of the features of Accurate service. Certainly, we could "get by" without it like so many other spring manufacturers do. But we have found it pays off handsomely for our customers *and* ourselves. The customer gets uniformly good springs with savings in time and money because there are fewer rejects and assembly runs more smoothly. We come out ahead because our customers are pleased and we're not subjected to a flood of substandard "returns." In the overall, it means lower costs for everyone.

The best way to find out what we mean is to give us a trial. For a quotation just send a drawing and specifications or, if you prefer, Accurate engineers will be pleased to give their assistance in developing new or improved design. ACCURATE SPRING MFG. CO. 3823 W. Lake St., Chicago 24, Illinois.

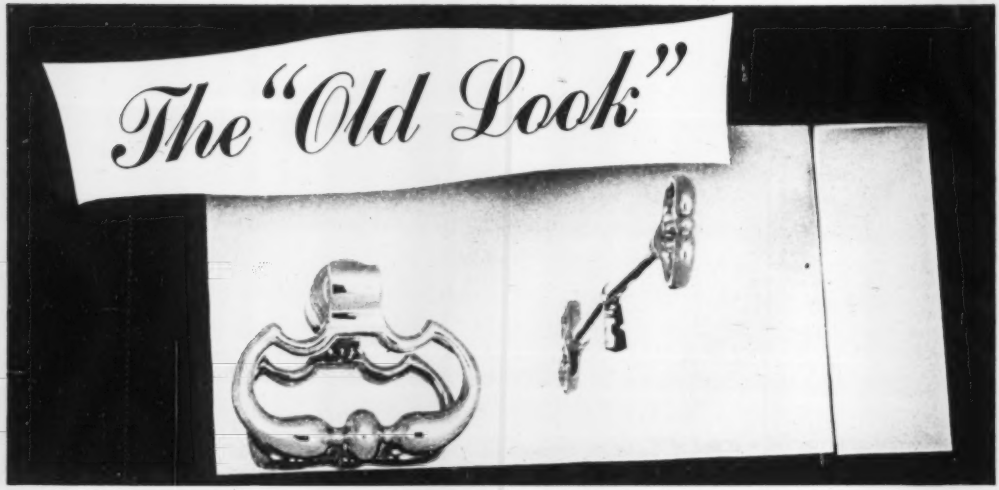
Write for your copy of the new revised Accurate Handbook of Technical Data on Springs. This booklet has been out of print for some time and if you have previously requested a copy and have not received it, we would appreciate your asking again.

Be sure the springs you buy are Accurate

Accurate Springs

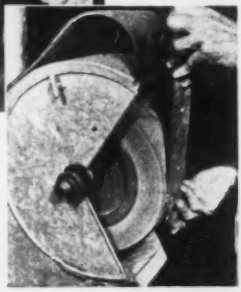
Springs
Wire Forms
Stampings

The "Old Look"



THE NEW WAY

Polishing ornate brass push plate, showing operator about to make downward pass on LIGHTNING METALITE #240 grit belt.



Oiling-out operation on brass push plate, using #280 LIGHTNING METALITE Cloth Belt with light grease.

. . BEHR-MANNING BELT FINISHING METHODS help P. E. Guerin, Inc., of New York achieve that satiny "old world" finish on their brass products, so admired by lovers of fine craftsmanship.

LIGHTNING® METALITE® Cloth Belts, with every sharp abrasive grain electro-coated in its sharp-end-up, best cutting position, and anchored firmly to the flexible cloth backing by the firm, double-grip of the DURABONDED® process, produce this finish free of scratches, marks and holidays — and with assembly-line production speed and economy.

Behr-Manning belts and engineering are putting contour and pre-plating finishing on a higher production plane everywhere. See what they can do on your work. Write for a demonstration. Address Dept. S-11.

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NORTON abrasives

BEHR-MANNING • TROY, N. Y.

COATED ABRASIVES • SHARPENING STONES

PRESSURE-SENSITIVE TAPES

EXPORT: BEHR-MANNING OVERSEAS INC., NEW ROCHELLE, N. Y., U. S. A.

is installed through the distributing pan or header within the drum.

Rollover-Clamp Added to Truck

USE REPLY CARD—CIRCLE No. 18

Rollover-clamp is added to the line of special attachments for fork trucks made by Baker Industrial Truck Division, Baker-Raulang Co., 1250 W. 80th St., Cleveland 2, O. Clamp is installed on the company's 4000-pound capacity trucks, where it can handle pallet loads of material on the forks, dump skid boxes with the rotating head and use the forks as clamps for handling miscellaneous objects. One type of operation the

. . . handles loads to 2400 pounds

attachment's design indicates is dumping skid boxes of steel scrap into a baling machine, then using the clamp to pick up the finished bales and load them into gondola cars. A 4000-pound truck outfitted with the rollover-clamp handles loads to 2400 pounds, 48 inches long. The company's truck in this capacity has telescopic lift to 126 inches; a nested height of 83 inches.

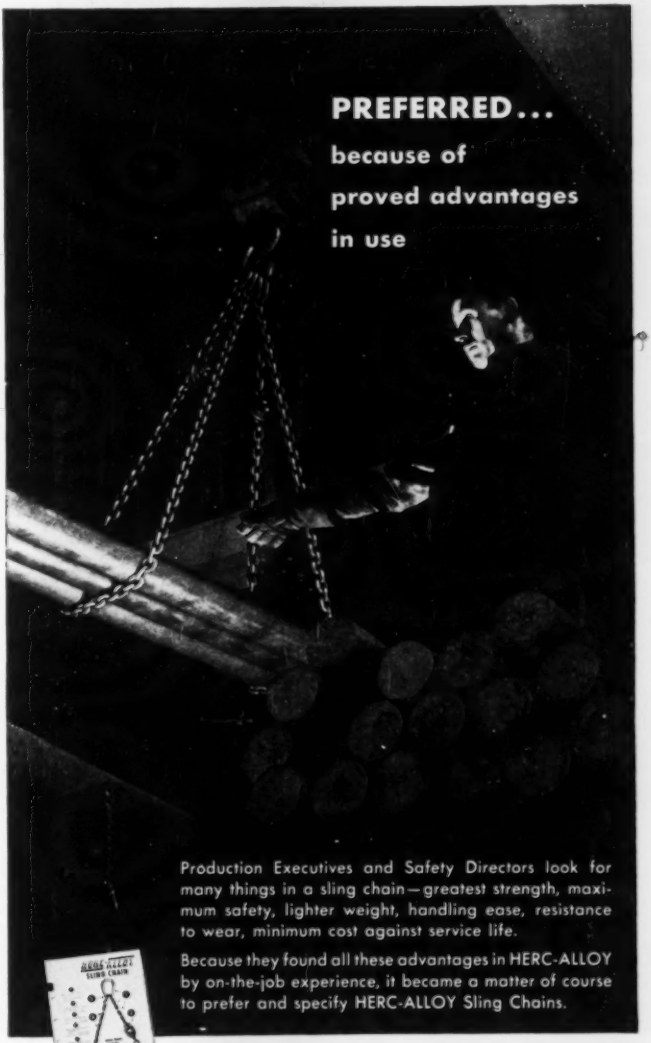
Speeding Taper Turning

USE REPLY CARD—CIRCLE No. 19

Flat template device that eases and speeds taper turning is announced by Lodge & Shipley Co., 2051 Colerain Ave., Cincinnati 25, O., for installation on its Copymatic lathe. Workpieces with peripheries or bores of continuous tapers are contour turned directly from the attachment. When tapers form only a part of the surface, attachment is used to speed production of a round template. Template is then placed between the standard duplicating centers for tracer controlled duplication in any quantity.

Swivel bar and scale are incorporated in the attachment. The bar, modeled on the standard tail end template support, can be angled accurately to the desired taper. For adjustment, bar is unlocked and set to the correct taper as indicated by the

HERC-ALLOY
SLING CHAINS



Production Executives and Safety Directors look for many things in a sling chain—greatest strength, maximum safety, lighter weight, handling ease, resistance to wear, minimum cost against service life.

Because they found all these advantages in HERC-ALLOY by on-the-job experience, it became a matter of course to prefer and specify HERC-ALLOY Sling Chains.

Write for illustrated Data Book No. 3 which contains helpful information on sling chain selection and use.

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(Affiliated with Chisholm-Moore Hoist Corp.)
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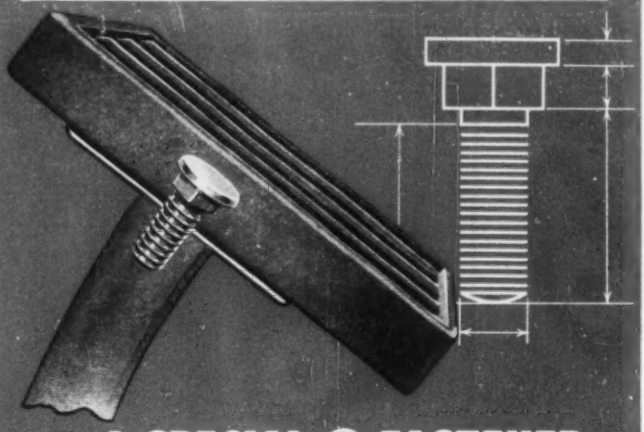

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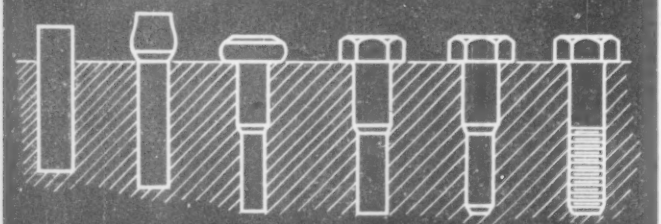
made with **DIMENSION CONTROL** *and*

UNIFORM HIGH STRENGTH



Steps in the "Double Extrusion" Process

The production of this Brake Pedal Bolt represents the latest in cold-heading techniques. The strength of the bolt is actually increased during the fabricating processes. Even the threading is done without breaking the "skin" of the metal. Best of all, the economy that is effected by modern methods makes possible a wider use of bolts "designed to fit the job".

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Division of Buffalo-Eclipse Corporation

NORTH TONAWANDA, NEW YORK

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Our Specialty is **"SOMETHING SPECIAL"**

direct reading scale incorporated in the attachment.

Geared Head Lathes

USE REPLY CARD—CIRCLE No. 20

Dominion all geared head lathes made by Colchester Lathe Co., Colchester, England, are offered in the U. S. by British Industries Corp., 164 Duane St., New York 13, N. Y. All geared headstock forms a totally enclosed oil bath that is self-lubricating. Front of the spindle is carried on double row cylindrical roller bearings with combined thrust and radial bearing at the rear end forming extremely rigid spindle layout. Cutting thrust is taken by a precision ball thrust race. Feed and screw cutting controls are interlocked to prevent simultaneous engagement. Straight bed is of inverted V type. All models have self-contained motor drive and motor is controlled by a lever on the front of the headstock, operating through an air-break starter built into the machine.

Die Head Line

USE REPLY CARD—CIRCLE No. 21

A die head line for Brown & Sharpe automatics and small turret lathes is introduced by Jones & Lamson Machine Co., Springfield, Vt. Die sizes are arranged so that a single given size die will cover the capacity of a given B&S machine size. Features include both radial and tangent chasers mounted on face of die for free coolant flow and good chip clearance; Dualife insert chasers for No. 00 machine dies, allowing turning over and using on the other side.

Voltage Tester

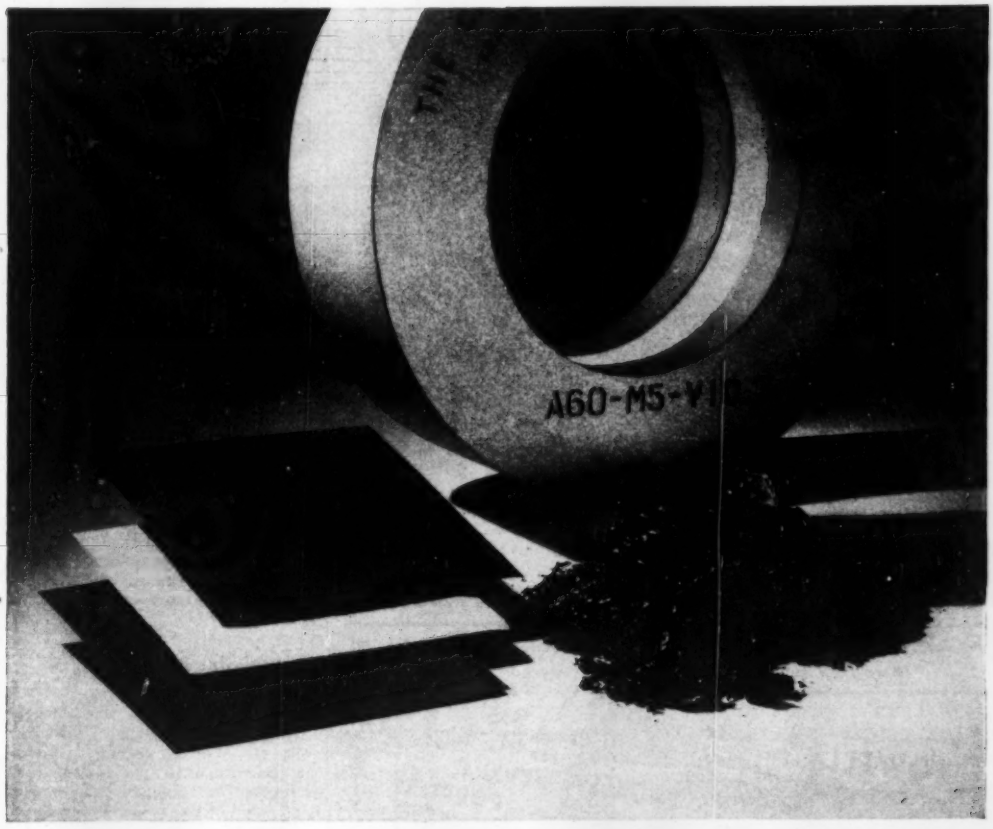
USE REPLY CARD—CIRCLE No. 22

Square D Co., Detroit 11, Mich., offers a redesigned model of their Wigginton voltage tester. By mounting one prod in either receptacle direct probing can be made with both hands with the voltage scale clearly visible. By mounting both prods in top of the slotted receptacles, line to ground and similar tests can be made with one hand.

Makes Valve Leakproof

USE REPLY CARD—CIRCLE No. 23

Rodic Chemical & Rubber Corp., New Brunswick, N. J., announces Rand Seal to make possible a leakproof valve. Essential operation of the seal is based on working with rather than against the fluid flow. The cone-shaped seal is closed in the same direction as the movement of the liquid, allowing high or low pressures to seal the valve. The cup-



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shaped conical washer of the seal incorporates an imbedded metal plug which eliminates bending and warping and makes seal leakproof.

Center Minimizes Overhang

USE REPLY CARD—CIRCLE No. 24

Red-E antifriction centers of the built-in type, developed by Ready Tool Co., Bridgeport, Conn., eliminate overhang and permit full clearance as well as maximum distance between centers. They are assembled with precision angular contact, antifriction ball bearings, preloaded and locked in. They are recommended as replacements for built-in type live spindle.

Protection from Oxides

USE REPLY CARD—CIRCLE No. 25

Mine Safety Appliances Co., Pittsburgh 8, Pa., introduces the Comfo ultra-filter respirator that is designed to protect workmen exposed to oxides of beryllium, radioactive dusts and similar hazardous particulate matter. It has a filter efficiency of 99.99 per cent against particles 3/10-micron in size.

Aids Plating Process

USE REPLY CARD—CIRCLE No. 26

Copper-Glo for the Ronal bright copper process is available from Lea Mfg. Co., Waterbury, Conn. It makes it practicable to plate prefinished steel and die castings directly with chromium without any intermediate buffing operation.

Rings with Pressed Lock Joints

USE REPLY CARD—CIRCLE No. 27

Use of the steel rings with a pressed lock joint feature, made by Wenthe-Davidson Engineering Co., Milwaukee 8, Wis., permits working to a tolerance sufficiently close to allow for press fit assemblies.

Forged-Rib Joint Pliers

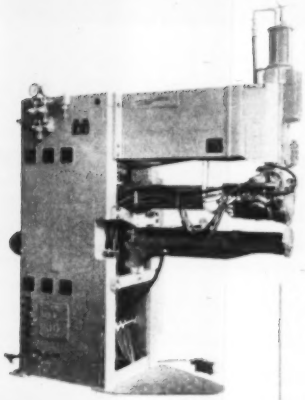
USE REPLY CARD—CIRCLE No. 28

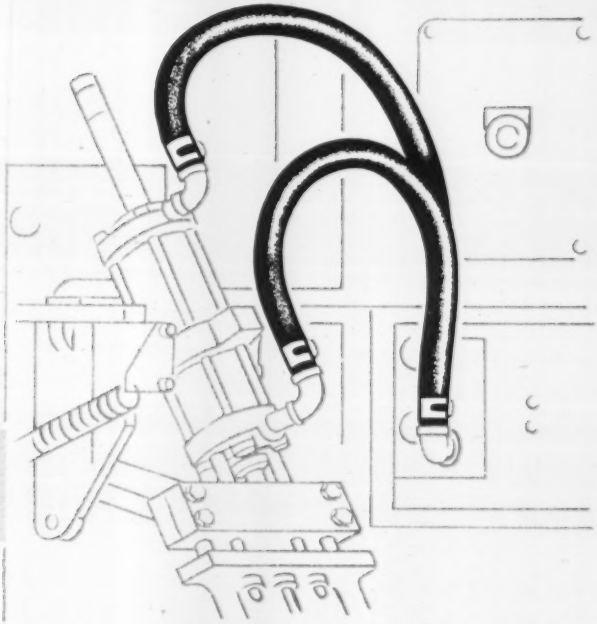
Utica Drop Forge & Tool Corp., Utica 4, N. Y., offers forged-rib joint pliers. Ribs are formed in the forging process, there is no machining of the joint itself. This process is claimed to give extra strength.

Hand Operated Valves

USE REPLY CARD—CIRCLE No. 29

Unitite valves, made by Hanna Engineering Works, Chicago 22, Ill., feature a chrome plated stem for minimum wear, Neoprene stem collar to prevent abrasion from ambient dust, a standard grease fitting at top of





● Side view of a Taylor-Winfield swivel head seam welder showing vital lengths of Republic Rubber Air Hose and Water Hose.

Rubbernecks

...for swivel head resistance welders

● Lack of backbone pays off big in the resistance welding field. Here, as in many industries, it's flexibility that counts, and in this department Republic Air Hose and Water Hose are real rubbernecks.

Despite constant flexing, stretching, cramping and sudden pressure changes, measured amounts of air, water and coolants get through the smooth inner tubes of Republic Hose.

And the delivery keeps up longer . . . long after ordinary hose has become exhausted!

Republic Hose is built with tougher covers . . . has specially braided carcasses made of finer twisted cords, specially treated to stand up better on the job. And Republic Hose costs less to use.

Your local Republic Distributor is an expert in the many applications of industrial rubber products. He can help you to select the right type of hose for your operation. Yes, for any operation in any industry. Why not check with him today? Or write direct for information. Remember, Republic Rubber has been **the** specialist in the manufacture of industrial rubber products for nearly half a century.

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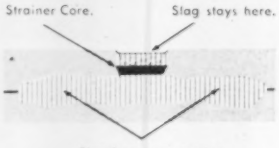
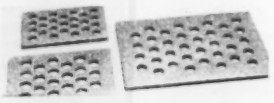
ALSIMAG STRAINER CORES—show little abrasion from the metal stream—give positive even flow of metal—have even thermal expansion—withstand all normal pouring temperatures—are easier and quicker to use because they will take rough handling—start saving you money the day you begin to use them.

Rejects in one foundry were cut 35% upon the installation of AlSiMag Strainer Cores. Another foundry, after long experience, states, "In all cases a definite improvement was noted if the molding procedure included the use of AlSiMag Strainer Cores."



Do you know about AlSiMag Cut-off Cores? Sometimes called Feeder Cores, these perforated flat ceramic pieces fit into gate of mold, are made in any size and with any number and size of holes. Inquire today.



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stem and a lumen bronze disk. Three mounting styles are available: Standard, column and manifold. Valves are made for three or four-way operation by air, oil or water, up to 250 psi in $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{3}{4}$-inch sizes, to 150 psi for 1-inch and up to 100 psi for $1\frac{1}{4}$-inch size.

Four-Way Valve

USE REPLY CARD—CIRCLE No. 30

Wisler Engineering & Machine Co., Sturgis, Mich., announces the Sincro four-way valve with built-in speed control. It requires a maximum of 70 degrees of lever movement and places all adjustments at operator's finger tips. Valve has no ball seats to leak or springs to fail.

Power Screwdriver Bits

USE REPLY CARD—CIRCLE No. 31

A complete line of $\frac{1}{4}$-inch hex drive and threaded shank bits for slotted, Phillips and Frearson or Reed and Prince screws is available from Ludwig Hommel & Co., Pittsburgh 22, Pa.

Dies and Die Holders

USE REPLY CARD—CIRCLE No. 32

Monocone dies and die holders for screw machines and other equipment are being produced by Pratt & Whitney, Division Niles-Bement-Pond Co., West Hartford, Conn., as companion products to the Duocone line of dies and holders. They provide users with a choice of two types of concentric-adjustment dies, flat-backed and cone-backed, from a single source. They are made of either high speed or carbon steel.

Protective Coating

USE REPLY CARD—CIRCLE No. 33

Coal tar pitch compounded into a fast drying protective coating by breaking it down into minute molecules and combining it with water and a stabilizing emulsification agent to form a permanent suspension that can be brushed or sprayed is available from Flash-Stone Co. Inc., Philadelphia 44, Pa. Known as Tarlac, it retains all protective and adhesive qualities of coal tar pitch and is im-

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Just circle the corresponding number of any item in this section for more information.

Helpful Literature

74. Cutting Fluids & Oils

D. A. Stuart Oil Co.—Consisting of four issues of "Stuart's Shop Notebook" bound together in booklet form, manual describes cutting fluids for high speed screw machine, for tapping and threading, oils for broaching and water-mix fluids for grinding. Tools and machinery are illustrated, and general recommendations tabulated.

75. Differential Converter

Minneapolis - Honeywell Regulator Co., Brown Instruments Div.—Featuring fast speed of response for flow control and continuous range change adjustment from 0-20 to 0-200 in. of water, differential converter described in 12-page illustrated catalog 2281 transmits measurements up to 1000 ft.

76. Resistance Testers

Shallcross Mfg. Co.—Complete line of low resistance test sets and milliohmmeters is described in illustrated bulletin L-12. Instruments are suitable for measuring contact resistance of switches, relays and circuit breakers; resistivity of heavy conductors and bar-to-bar resistance of commutators as well as quality of welds and bonds.

77. Metalworking Machines

Reed Engineering Co.—12-page illustrated general catalog No. 81 has descriptions of standard and optional features, plus sizes, specifications and capacities of pinch and pyramid type bending rolls, cone rolling and offset forming machines, turning rolls, automatic welding gantries and welding fixtures and positioners.

78. Shape Straighteners

Medart Co.—Four shape straighteners, one stretcher leveler straightener and one roller leveler straightener are described in 4-page illustrated folder. Machines are for ferrous or nonferrous use. First four are of single and two-plane, fixed and variable center types.

79. Aluminum Bronze

Ampco Metal, Inc.—Corrosion and erosion resistant properties of Ampco alloys which adapt them for process industry applications are related in 20-page illustrated bulletin PI-3. Physical and chemical properties of various aluminum bronze alloys and their recommended applications are listed. Data are given on pump fittings, valves, pipe, tube and tube sheet.

80. Refractory Coating

Williston & Co.—Cera-Kote, a refractory coating made from ceramic and metallic materials is described in illustrated 4-page bulletin. Partial check list of users and uses of product are included, noting application to both brick and plastic refractories.

81. Slide Feed Machine

Mettler Machine Tool, Inc.—"Shuster Automatic Slide Feed Machines" is 2-page illustrated sheet featuring machine which cuts from ¼ to 10-in. lengths of round, square or hexagon stock up to 9/16-in. diameter.

82. Infra-Red Heating

Fostoria Pressed Steel Corp.—20-page highly illustrated pamphlet "How Thousands of Plants Cut Costs" presents advantages of infra-red process for baking, drying, dehydrating, preheating, degreasing and other industrial heating applications. Even-ray ovens feature specular gold reflecting surfaces for up to 98 per cent radiation efficiency.

83. Gear Hobber

Hamilton Tool Co.—Typical work produced by and complete specifications for No. 1 gear hobber are presented in 4-page illustrated bulletin H 1-49. This precision machine tool is designed for rapid generation of small spur, spiral and bevel gears; gear sectors; spline shafts; pinions and worm gears.

84. Wet Blast Equipment

American Wheelabrator & Equipment Corp.—Details of model 43 Liquamatte for wet abrasive blasting are presented in 4-page illustrated bulletin 23. New machine is designed for all cleaning applications in chemical and metalworking industries where close tolerances must be held or where breakdown of sharp edges must be avoided.

85. Welding Electrodes

Alloy Rods Co.—History of many types of welding electrodes used by company in armament program for World War II and since then in defense production is discussed in 12-page booklet AR51-1. Covered are armor welding; and high temperature, corrosion resistant and low hydrogen ferritic electrodes.

86. Punch Presses

Wales-Strippit Corp.—Twin column presses used for blanking, forming, drawing and bending are subject of 8-page illustrated catalog TC. Hole punching, shearing and notching attachments are covered as well.

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HELPFUL LITERATURE

87. Load Cells

Automatic Temperature Control Co.—Application of Atcotran torsion bar and cantilever beam load cells which measure force in tension, compression, thrust, torque and weighing are described in engineering data sheets 62 and 65. Former are available in ranges from 0-100 to 0-2500 lb, while latter can be had in ranges from 5 to 500 lb.

88. Water Columns & Gages

Yarnall-Waring Co.—20-page illustrated bulletin WG-1811 presents detailed descriptive and technical information pertinent to Yarway water columns and gages. Columns are made in 12 models for steam pressures up to 2500 psi. Levels come in vertical and Sesure-inclined types for pressures up to 2500 and 400 psi, respectively.

89. Electronic Inspection Units

Arlin Products, Inc.—Two illustrated folders "The Finest in Electronic Inspection Equipment" deals with automatic equipment which weighs, feeds, measures and sorts precision work pieces at rates up to 20,000 per hour. Machines employ electronically controlled hoppering systems.

90. Electric Brakes & Clutches

Warner Electric Brake & Clutch Co.—Information on design and application of electric brakes and clutches, as well as unit sizes, r[illegible]anting dimensions and performance specifications are contained in new handbook No. 701-A.

91. Sand Slinging Equipment

Pettibone Mulliken Corp., Beardsley & Piper Div. — Descriptions of all Tractor Sandslinger, Motive Sandslinger and Motive Speedslinger models is given in 28-page illustrated bulletin No. 1515. Slinger method of ramming sand into molds and when it should be used are covered, along with application data.

92. Copper Alloy Welding

American Brass Co.—24-page illustrated B-13 manual "Anaconda Welding Rods and Procedures" covers use of Tobin bronze, phosphor bronze, Everdur, nickel silver, low fuming bronze, copper, Super-nickel and Ambraloy for production and repair, and for building up worn surfaces. Welding techniques discussed include oxyacetylene, metal arc, carbon arc and inert gas shielded. Full specifications of alloy rods are given.

93. Synchronous Motors

Allis-Chalmers Mfg. Co.—Features of low-speed coupled-type pedestal-bearing synchronous motors are outlined in 6-page illustrated folder No. 05B7648. Sizes range from 100 hp and up at speeds of 450 rpm or less. Motors of 1.0 power factor or 0.8 or better leading power factor are available.

94. Recording Instruments

Streeter-Amet Co. — "Printing Instruments" is 4-page illustrated bulletin which briefly describes pulse count, time interval and revolution count recorders. Basic counting and printing units are used with variable components to meet practically any need.

95. Quenching Oil Cooling

Whitlock Mfg. Co.—Constant and correct oil temperatures are automatically provided during quenching by batch type quenching oil cooling system described in illustrated 2-page bulletin No. 102. Engineering data, diagrammatic sketch and system ratings are included.

96. Diamond Grinding Wheels

Wickman Mfg. Co.—24-page 8½ x 11 in. catalog features expanded line of diamond grinding wheels, including resinoid and steel bonded diamond wheels, steel bonded chip breaker wheels and resinoid and steel bonded hand hones.

97. Malleable Castings

Belle City Malleable Iron Co. and Racine Steel Castings Co.—Facilities for producing medium to large malleable castings, on contract basis known as "cope and drag work," are covered in 4-page illustrated folder No. 11.

98. Electric Motors

Wagner Electric Corp.—Tabulated data on type, characteristics, ratings and application of polyphase squirrel-cage and wound-rotor, single-phase, enclosure type and multispeed electric motors can be found in 4-page folder MU-94. Units cover ratings from 1/6 to 400 hp.

99. Electric Trucks

Yale & Towne Mfg. Co., Philadelphia Div.—Yale Worksaver line of ride 'em or walk 'em industrial trucks in capacities up to 6000 lb are described and illustrated in 16-page bulletin P809. Applications, types and operating features of motorized hand trucks and electric stackers are given.

100. Fire Protection Equipment

American-LaFrance-Foamite Corp.—32-page booklet "Correct Fire Protection" tells what one should know about modern fire-fighting devices and the fire extinguishing agents used in them. Various sizes of extinguishers available for use with these agents are illustrated and described.

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FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) Cleveland, Ohio

BUSINESS REPLY CARD

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STEEL

Penton Building

CLEVELAND 13, OHIO

Readers' Service Dept.

pervious to oils, greases and other petroleum derivatives, acids, alkalis, water and condensation.

Wax Coolant

USE REPLY CARD—CIRCLE No. 34

No. 170 wax coolant, developed by S. C. Johnson & Son Inc., Racine, Wis., is for use with power hack saws and routers. The nonflammable aqueous wax emulsion reduces wear of router bits when used with radial arm routers and eliminates much of the welding and burring on routed edges. It is also said to lengthen the life of saw blades.

Self-Contained Packing Unit

USE REPLY CARD—CIRCLE No. 35

Monopak-cartridges, self-contained packing assembly for hydraulic and pneumatic cylinders are available from Hydraulic Accessories Co., Detroit 26, Mich. They combine all necessary packings, bearings and rod-wipers into one compact unit. Units are available for light or heavy duty service in three distinct designs for rod sizes ranging from ⅝ to 3½ inches in diameter.

Floor Resists Disintegrators

USE REPLY CARD—CIRCLE No. 36

AWOG floors, announced by Flexrock Co., Philadelphia 4, Pa., will resist common floor disintegrators such as acid, water, oil and grease. Its durability is attributed to its tight, close-knit composition. Liquids cannot penetrate to attack the bonding element. The flooring is recommended for new floors, overlays over brick, stone or wood, for repairing or resurfacing areas of any size, indoors or out.

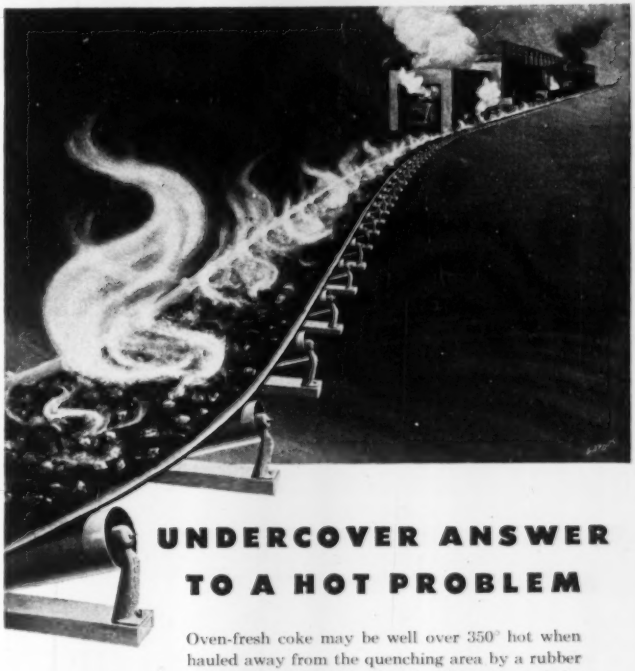
Descaling, Cleaning Attachment

USE REPLY CARD—CIRCLE No. 37

A pipe and tube descaling and cleaning attachment for Steen cutoff machines is announced by Continental Machine Co., Chicago 14, Ill. It cleans rust, scale, paint and other deposits from pipes, posts and building columns. Sizes are available for cleaning pipes up to 12 inches in diameter.

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.



UNDERCOVER ANSWER TO A HOT PROBLEM

Oven-fresh coke may be well over 350° hot when hauled away from the quenching area by a rubber covered conveyor belt. That is why ordinary belts lead such a short, scorched life when used for handling coke, or sand, or lime, or sinter (roasted ore) as well as other materials that are hot.

To solve such problems, Hewitt-Robins developed belting built up inside with plies of Fiberglas*, cotton, asbestos and synthetic fabrics—and covered outside with especially developed and compounded rubber and synthetics. The fabrics contribute to high dimensional stability and tensile strength; the covers resist heat and abrasion. Both combine to give Hewitt-Robins Hot Materials Conveyor Belting much longer service life.

Hot Materials Conveyor Belting is one of many Hewitt-Robins "firsts" in materials handling belting, machinery and techniques. It is a product of an organization unique in its field. Only Hewitt-Robins can deliver—from within its own corporate structure—all three elements of a belt conveyor system: engineering, machinery *and belt*. Only Hewitt-Robins can assure individual responsibility for their successful operation—because only Hewitt-Robins makes them all.

When the handling of materials—hot or cold—is your problem, we invite you to make it ours. Our three industrial divisions are ready, individually or collectively, to meet your needs.

*T. M. of Owens-Corning Fiberglas Corp.

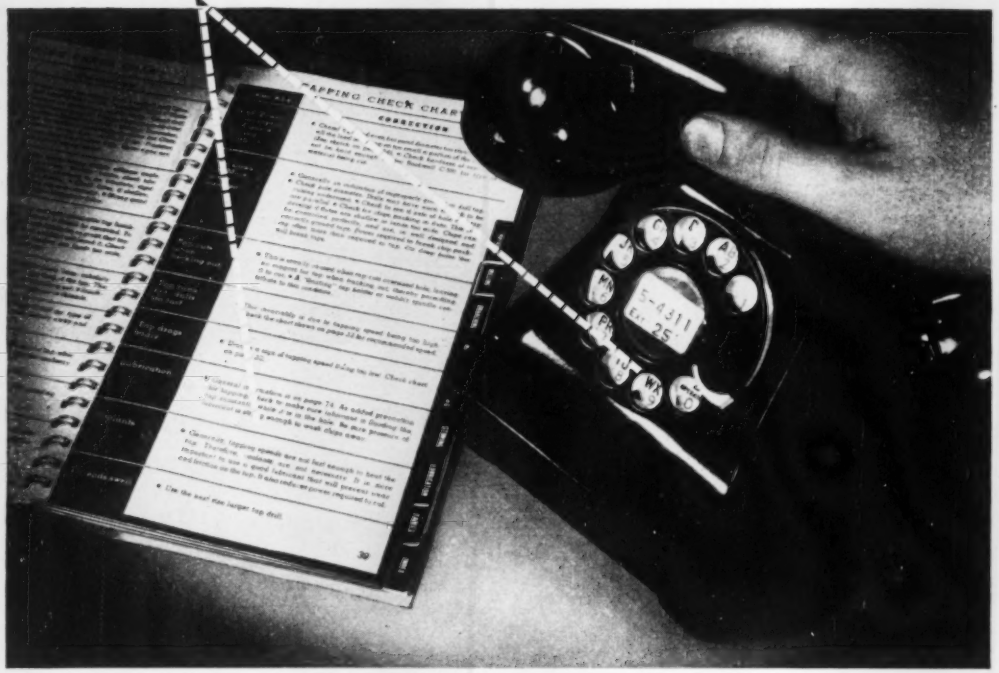
HEWITT HR ROBINS

Executive Offices: 370 Lexington Avenue, New York 17, N. Y.

HEWITT RUBBER DIVISION: Belting, hose and other industrial rubber products
ROBINS CONVEYORS DIVISION: Conveying, screening, sizing, processing and dewatering machinery
ROBINS ENGINEERS DIVISION: Designing and engineering of materials handling systems

Hewitt-Robins is participating in the management and financing of Kentucky Synthetic Rubber Corporation

MARKS YOUR ANSWERS



to problems where you're TAPPING stainless

Let's face it. Even in the best plants, machining problems come up from time to time.

Maybe tapped holes aren't always accurate. Or taps may become dull too soon. The point is that you don't have to put up with difficulties on a Stainless tapping job. Or *any* Stainless machining job, for that matter.

More and more production men are finding a quick and sure way to get the results they want, in a hurry. They just pick up the phone and call the nearest Carpenter mill branch warehouse for personal help and printed information to solve specific problems. And it works.

It's what you might call a "Stainless Prescription Service". You name the problem and Carpenter works with you to find the answer. Try it today. The chances are that we can put our Stainless experience to work, to *your* advantage.

Shop notes on TAPPING stainless to help your men improve results and conserve stainless steel

IF TAP CUTS WHEN BACKING OUT... This is usually caused when tap cuts oversized hole, leaving no support for tap when backing out, thereby permitting it to cut. A "floating" tap holder or wobbly spindle contribute to this condition.

IF THREADS ARE ROUGH... If all other factors and variables have been carefully checked, try a negative grind on the heel of the tap. This overcomes tap tearing threads when backing out. Insufficient hook angle can also cause roughness in threads.

WHEN TAP RUNS HOT, DULLS... This invariably is due to tapping speed being too high. Check the chart in Carpenter's Notebook for recommended speed.

For more information on Tapping, use Carpenter's "Notebook on Matching Stainless Steels"

DON'T WAIT... COOPERATE!
The U.S. Needs Your Steel Scrap, Now

The Carpenter Steel Company, 139 W. Bern St., Reading, Pa.
Export Department: Carpenter Steel Co., Reading, Pa.—"CARSTEELCO"

Carpenter
STAINLESS STEEL
takes the problems out of production

The Market Outlook

BALANCE between steel supply and demand is months distant. Soft spots appearing in some areas of the market are deceptive of the real situation. They largely reflect the changing pattern of consumption under stress of expanding defense needs. Restrictions on use of metals in consumer durable goods, in the main, account for the current contraction in requirements of steel in many consumer goods lines. Meanwhile, the resulting slack is being taken up by diversion of steel to defense and related activities. Demand still outruns supply by a wide margin in all the major products, overall pressure on the mills continuing just as strong as ever.

LONG TERM— While the short term view is one of tight supply, outlook for the longer term, beyond mid-1952, is something else again. Increasingly, the view is spreading in steel circles, that barring heavy losses in production as result of labor trouble and scrap shortage later this winter, some products may be in excess supply before end of 1952. This, of course, presupposes all-out war will be avoided and that the defense program will not be greatly enlarged. Thinking is governed by the fact defense requirements in many directions should be pretty well satisfied by that time, and the further fact substantial new steelmaking capacity, scheduled to come into operation throughout 1952, will contribute materially to filling the gap between supply and demand. Steelmaking capacity by end of next year is expected to total about 118 million ingot tons annually. Capacity at the beginning of this year was 104,229,650 tons.

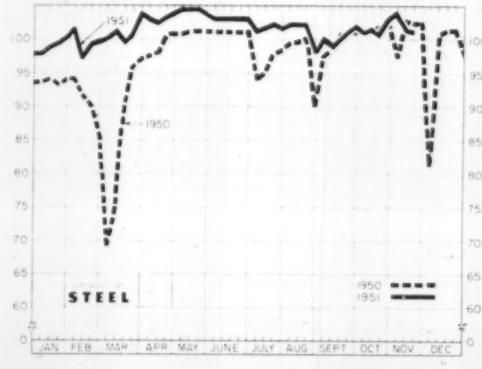
STRUCTURALS— No early relief in tight structural supply is seen. Restrictions on construction are reflected in spotty inquiry and relatively few current awards. Numerous projects are pending for which no steel now is in sight. Structural steel allotments for first quarter next year will approximate 900,000 tons out of estimated supply of 1,425,000 tons. This is just about the same as authorized allotments in the current quarter. In allotting tonnage for first quarter, those programs considered more essential in the mobilization effort are favored at the expense of others. In virtually all cases allotments for the period fall below stated requirements. Actually, the screened, stated requirements for all Defense Production Administration claimant agencies, as well as National Production Authority industry divisions, amount to more than 200 per cent of available supply of structural material in first quarter.

OTHER PRODUCTS— Because of the necessity for increasing production of heavy plates by approximately 200,000 tons a quarter, light, flat-rolled product output is expected to be cut by that amount as more time on continuous mills is diverted to production of light plates. The diversion will release space on the conventional mills for production of heavy plates. Substantial fourth quarter plate orders still remain unplaced with the mills and to care for these NPA reportedly is incorporating additional plate tonnage in December mill schedules, thus pushing into January tonnage already scheduled for December delivery. Diversion of light plate production to the continuous mills will more than offset the slack in sheet demand attending consumer goods contraction. Producers of carbon bars are out of the market on most sizes for first quarter and are not expected to open books for second quarter much before yearend. In the bar market, government directives are increasingly displacing tonnage already scheduled. Pig iron supply is in closer balance with demand than for many months, but interest in first quarter needs is quickening as defense castings needs show signs of mounting.

PRICES— Price stability continues to characterize all iron and steel product markets. Uncertainty prevails as to the trend of prices, however, with steel wage negotiations scheduled to start about Dec. 1.

PRODUCTION— Steel mills continue to pour more than 2 million tons weekly although shutdowns because of labor trouble and repairs have forced operations from the year's high. The national ingot rate eased ½ point to 101 per cent of capacity.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Nov. 17	Change	Same Week 1950	Same Week 1949
Pittsburgh	102	+ 0.5	104	43
Chicago	108	+ 2.5*	104	43
Mid-Atlantic	101	0	100	79.5
Youngstown	106	0	104	50
Wheeling	99	— 1	99.5	78
Cleveland	100.5	— 0.5*	102	73
Buffalo	104	0	104	101
Birmingham	50	+ 33	100	25
New England	90	0	91	73
Cincinnati	103	— 3	106	56
St. Louis	88.5	— 1.5	95	91.5
Detroit	101.5	0*	106	79
Western	102	0	101	58
Estimated national rate	101	— 0.5	102.5	56

Based on weekly steelmaking capacity of 1,999,634 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 51 Production-Engineering News—p. 87

Composite Market Averages

FINISHED STEEL INDEX, Weighted:	Nov. 15 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av. = 100)	171.92	171.92	171.92	157.76	112.04
Index in cents per lb.	4.637	4.637	4.637	4.274	3.035
ARITHMETICAL PRICE COMPOSITES					
Finished Steel, NT	$106.32	$106.32	$106.32	$95.09	$64.45
No. 2 Fdry. Pig Iron, GT.	52.54	52.54	52.54	49.54	28.17
Basic Pig Iron, GT	52.16	52.16	52.16	49.04	27.50
Malleable Pig Iron, GT	53.27	53.27	53.27	50.27	28.79
Steelmaking scrap, GT	43.00	43.00	44.00	41.67	24.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted: Delivered prices based on nearest production point.

FINISHED MATERIALS	Nov. 15 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.45	2.50
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.50
Bars, H.R., del. Philadelphia	4.223	4.223	4.223	3.93	2.86
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.15	3.10
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.40	2.35
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.35
Shapes, del. Philadelphia	3.918	3.918	3.918	3.46	2.48
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.50
Plates, Chicago	3.70	3.70	3.70	3.50	2.50
Plates, Coatesville, Pa.	4.15	4.15	4.15	3.90	2.50
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.50
Plates, Claymont, Del.	4.15	4.15	4.15	3.90	2.50
Sheets, H.R., Pittsburgh	3.60-75	3.60-75	3.60-75	3.35	2.425
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.425
Sheets, C.R., Pittsburgh	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.41
Sheets, Galv., Pittsburgh	4.80	4.80*	4.80	4.40	4.02
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.50-3.75	2.35
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.35
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.15-4.85	3.05
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	3.15
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.10	3.185
Wire, Basic, Pittsburgh	4.85-5.10	4.85-5.10	4.85-5.10	4.50-4.75	3.05
Nails, Wire, Pittsburgh	5.90-6.20	5.90-6.20	5.90-6.20	5.30-5.60	3.75
Tin plate, box, Pittsburgh	$8.70	$8.70	$8.70	$7.50	$5.25
SEMIFINISHED					
Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$63.00	$47.00
Wire rods, ½-⅝", Pitts.	4.10-30	4.10-30	4.10-30	3.85	2.30
PIG IRON, Gross Ton					
Bessemer, Pitts.	$53.00	$53.00	$53.00	$50.00	$29.00
Basic Valley	52.00	52.00	52.00	49.00	28.00
Basic, del. Phila.	56.61	56.61	56.61	53.39	29.93
No. 2 Fdry, Pitts.	52.50	52.50	52.50	49.50	28.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	49.50	28.50
No. 2 Fdry, Valley	52.50	52.50	52.50	49.50	28.50
No. 2 Fdry, Del. Phila.	57.11	57.11	57.11	53.89	30.43
No. 2 Fdry, Birm.	48.88	48.88	48.88	45.88	24.88
No. 2 Fdry (Birm.) del. Cin.	55.49	55.49	55.49	52.58	28.94
Malleable Valley	52.50	52.50	52.50	49.50	28.50
Malleable, Chicago	52.50	52.50	52.50	49.50	28.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	62.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt. Pitts.	$44.00	$44.00	$45.00	$44.00	$25.00
No. 1 Heavy Melt. E. Pa.	42.50	42.50	43.50	41.00	22.00
No. 1 Heavy Melt. Chicago	42.50	42.50	43.50	40.00	23.75
No. 1 Heavy Melt. Valley	44.00	44.00	45.00	43.75	25.00
No. 1 Heavy Melt. Cleve.	43.00	43.00	44.00	43.25	24.50
No. 1 Heavy Melt. Buffalo	43.00	43.00	44.00	41.50	24.25
Rails, Rerolling, Chicago	52.50	52.50	52.50	64.50	24.75
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	59.00	30.00*

* F.o.b. shipping point.

COKE, Net Ton					
Beehive, Furn. Connlsvl.	$14.75	$14.75	$14.75	$14.25	$8.75
Beehive, Fdry., Connlsvl.	17.50	17.50	17.50	16.50	9.50
Oven Fdry., Chicago	23.00	23.00	23.00	21.00	15.10
NONFERROUS METALS					
Copper, del. Conn.	24.50	24.50	24.50	24.50	17.50
Zinc, E. St. Louis	19.50	19.50	19.50	17.50	10.50
Lead, St. Louis	18.80	18.80	18.80	16.80	10.35
Tin, New York	103.00	103.00	103.00	132.00	70.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex.	42.00	42.00	42.00	32.00	23.50
Nickel, refinery, duty paid	56.50	56.50	56.50	48.00	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N. Y., del.	....	59.18	59.68	....
Newark, del.	56.87	57.37	57.87	58.27
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.88†	55.38†	55.88†	....
Syracuse, N.Y., del.	55.91†	56.41†	56.91†	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	57.00	57.50	....
Fontana, Calif. K1	58.00	58.50	....	....
Geneva, Utah G1	52.00	52.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
Los Angeles, San Francisco, del.	60.16	60.66	....	....
Granite City, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
Lone Star, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKees Rocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Sweedland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade. † Preliminary.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY IRON, Gross Ton (Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)	
Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton (Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)	
Niagara Falls, N.Y. P15	$88.00
Keokuk, Iowa, Openhearth & Fdry. frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton (Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)	
Lyles, Tenn. T3	$66.00

LOW PHOSPHOROUS PIG IRON, Gross Ton	
Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.37
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Nov. 15, 1951; cents per pound except as otherwise noted. Changes shown in Italics. Code numbers following mill points indicate producing company; key on next two pages

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$79.00
Munhall,Pa. U5 .....62.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston,Tex. S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 .....56.00
Fontana,Calif. K1 ....75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y., B2..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ...56.00
Carbon, Forging (NT)
Bessemer,Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3 ..73.00
Detroit R7 .....66.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 .....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. U5 .....66.00
Geneva,Utah G1 .....66.00
Houston,Tex. S5 .....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2 ..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2,U5,W14 ..66.00
So.Duquesne,Pa. U5 ...66.00
So.SanFrancisco B3 ...85.00
Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O.(29) T7 .....66.00
Conshohocken,Pa. A3 ..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston,Tex. S5 .....78.00
Ind.Harbor,Ind. Y1 ....70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2 ..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14..70.00
So.Duquesne,Pa. U5 ...70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ....103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago, Ill. R2 ....82.00
So.Duquesne,Pa. U5 ...82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 .....$3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown, R2, U5 ...3.35

WIRE RODS
Alton, Ill. 4.40
AlabamaCity,Ala. R2 ...4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.90
Houston,Tex. S5 .....4.50
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ....4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y.B11 ..4.10
Pittsburg,Calif. C11 ....4.75
Portsmouth,O. P12 .....4.30
Roebling,N.J. R5 .....4.20
So.Chicago,Ill. R2 .....4.10
SparrowsPoint,Md. B2 ..4.20
Sterling,Ill.(1) N15 ....4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ....4.90
Worcester,Mass. A7 ....4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ....4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 .....4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ...3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.60
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 .....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah G1 .....3.65
Houston,Tex. S5 .....4.05
Ind.Harbor,Ind. I-2 ....3.65
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.25
Lackawanna,N.Y. B2 ....3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 .....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 .....4.85
Pascagoula,Pa. P4 .....5.90
Portland,Oreg. O4 .....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5,W14..3.65
So.SanFrancisco B3 .....4.20
Torrance,Calif. C11 .....4.25
Weirton,W.Va. W6 .....3.90
Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 .....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 .....4.35
H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2 ...5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 .....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah G1 .....5.50
Ind.Harbor,Ind. I-2 ....5.50
Ind.Harbor,Ind. Y1 .....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 .....5.50
So.SanFrancisco B3 .....6.00
Struthers,O. Y1 .....6.00
Wide Flange
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fontana,Calif. K1 .....4.65
Lackawanna,N.Y. B2 ....3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65
H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.50
Lackawanna,N.Y. B2 ....5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 .....5.45
BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ....5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1 ...6.25
Gary,Ind. U5 .....5.65
Geneva,Utah G1 .....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y1 .....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.65
SparrowsPoint,Md. B2 ...5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 .....4.85
Coatesville,Pa. L7 .....5.25
Conshohocken,Pa. A3 ....5.05
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 .....4.75
SparrowsPoint,Md. B2 ...4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ....4.75
Ind.Harbor,Ind. I-2 ....4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 .....4.75

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ....3.95
Ashland,lcl(15) A10 .....4.45
Cleveland,c.l. R2 .....4.30
Warren,O.c.l. R2 .....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ...3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky. (15) A10 ...3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. C22 .....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 .....4.15
Conshohocken,Pa. A3 ....4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif.(30) K1 ...4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 .....4.40
Geneva,Utah, G1 .....3.70
Harrisburg,Pa. C5 .....6.30
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1..3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ....3.70
Minnequa,Colo. C10 .....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5, W14..3.70
SparrowsPoint,Md. B2 ...3.70
Steubenville,O. W10 .....3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 .....4.00
Youngstown R2, U5, Y1..3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.45
Geneva,Utah G1 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ...3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill. L1 .....4.15
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 .....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1..3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.30
Lackawanna,N.Y. B2 ....3.70
LosAngeles B3 .....4.40
Minnequa,Colo. C10 .....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11..3.70
Pittsburg,Calif. C11 .....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B2, W14 .....4.45
So.Chicago R2,U5,W14 ...3.70
So.Duquesne,Pa. U5 ....3.70
So.SanFran.,Cal. B3 ....4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 .....4.40
Weirton,W.Va. W6 .....3.85
Youngstown R2, U5 .....3.70

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ....3.70
Niles, Calif. P1 .....5.05
Portland,Oreg. O4 .....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES; H.R. CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.30
Houston,Tex. S5 .....4.70
Ind.Harbor,Ind. I-2, Y1 .4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 .....4.90
Lackawanna,N.Y. B2 ....4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2,U5,W14 ...4.30
So.Duquesne,Pa. U5 ....4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary, Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 .....5.55
IndianaHarbor,Ind. Y1 ..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ....5.55
Los Angeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 .....5.55
So.SanFrancisco B3 .....6.30
Struthers,O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....4.55
BeaverFalls,Pa. M12,R2..4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 .....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N3 .....4.55
Gary,Ind. R2 .....4.55
GreenBay, Wis. F7 .....4.55
Hammond,Ind. L2, M13..4.55
Hartford,Conn. R2 .....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 .....5.10
Massillon,O. R2, R8 .....4.55
Monaca, Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 .....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 .....5.10
Readville,Mass. C14 .....5.10
St.Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 .....4.55
SpringCity,Pa. (5) K3 ...5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 .....4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12 .....5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13..5.40
Hartford,Conn. R2 .....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 .....5.40
Mansfield,Mass. B5 .....5.85
Massillon,O. R2, R8 .....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 .....5.60
So.Chicago,Ill. R2, W14..5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 .....5.75
Youngstown F3, Y1 .....5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ....4.75
ChicagoHts.(3,4) I-2 ....4.75
Franklin,Pa. (3,4) F5 ....4.75
FortWorth,Tex.(26) T4 ...4.85
Huntingt'n,W.Va.(3) W7..5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda (3,4) B12 ....4.75
Williamsport(3) S19 .....5.00
Williamsport(4) S19 .....5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover,(Eng Bolt) U1 ....13.50
Dover,(Wrgt.Iron) U1 12.25
Economy,Pa. (S.R.) B14 9.60
Economy,Pa.(D.R.)B14 11.90
Economy,(Staybolt)B14 12.20
McK.Rks.(Staybolt) L5.14.50
McK.Rks.(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ....13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ....3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1..3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.30
Los Angeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 .....4.50
Niles,Calif. P1 .....5.05
Pittsburg,Calif. C11 .....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
SandSprings,Okla. S5 ....4.60
Seattle B3, N14 .....4.45
So.Chicago,Ill. R2 .....3.70
So.Duquesne,Pa. U5 .....3.70
So.SanFrancisco B3 .....4.60
SparrowsPoint,Md. B2 ....3.70
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 .....4.40
Youngstown, R2, U5 ....3.70

BARS, Reinforcing
(Fabricated; To Consumers)
Huntington,W.Va. W7 ..5.50
Johnstown, ¼-1" B2 ....4.75
LosAngeles B3 .....5.45
Marion,O. P11 .....5.00
Seattle B3, N14 .....5.55
So.SanFrancisco B3 .....5.45
SparrowsPoint,Md. B2 ....5.75
Struthers,O. Y1 .....4.75
Williamsport, ¼-1" R2 ....4.75
Williamsport, Pa. S19 ...5.10

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ...3.80
Ashland,Ky.(8) A10 ....3.60
Butler,Pa. A10 .....3.60
Cleveland J5, R2 .....3.60
Conshohocken,Pa. A3 ....4.00
Detroit M1 .....4.40
Ecorse,Mich.(8) G5 .....3.80
Fairfield,Ala. T2 .....3.60
Fontana,Calif. K1 .....4.55
Gary,Ind. U5 .....3.60
Geneva,Utah G1 .....3.70
GraniteCity,Ill. G4 .....4.30
Ind.Harbor,Ind. I-2, Y1..3.60
Irvin,Pa. U5 .....3.60
Lackawanna,N.Y. B2 ....3.60
Munhall,Pa. U5 .....3.60
Niles,O. N12 .....5.25
Pittsburg,Calif. C11 .....4.30
Pittsburgh J5 .....3.60
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 .....3.60
SparrowsPoint,Md. B2 ....3.60
Steubenville,O. W10 .....3.60
Torrance,Calif. C11 .....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 .....3.60
WestLeechburg,Pa. A4 ....3.75
Youngstown U5, Y1 .....3.60

SHEETS, H.R., (19 gage)
AlabamaCity,Ala. R2 ....4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2 .....5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 .....5.40

SHEETS, H.R., (14-ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ....5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 .....5.40
IndianaHarbor,Ind. Y1 ..5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 .....5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint (36) B2 ....5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 .....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....6.55
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1 ..7.05
Ind.Harbor,Ind. I-2 .....6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 .....6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2 ....6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 .....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland 35, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	4.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Cal. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert No. 16	Cu	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.60		...
Canton,O. R2	5.65	6.10	
Fairfield,Ala. T2	5.60	5.85	
Gary U5	5.60	5.85	
IndianaHarbor I-2	5.60	5.85	
Irvin,Pa. U5	5.60	5.85	
Kokomo,Ind. C16	6.25	...	
MartinsFy.O. W10	5.60	5.85	
Pittsburg,Cal. C11	6.35	...	
SparrowsPt. B2	5.60	...	
Torrance,Cal. C11	6.35	...	

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va. W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.30
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland R2	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.55
New Britain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	...
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	...
Detroit D2	5.60	6.65	7.25	...	...
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	...
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	...
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. NS: Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	6.80	7.40	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	...	6.80	7.40	9.35	11.65
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	...	10.30	12.50	15.35
NewYork W3	...	...	...	10.30	12.50	15.35

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40) T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) NS	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

TIN PLATE, Electrolytic (Base Box)

	0.25-lb	0.50 lb	0.75lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower) Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	...	...	...
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	...	...	...
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

SHEETS, Culvert No. 16 Pure Iron	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut-lengths)	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00
Niles,O. N12 (cut lengths)	...	6.75	7.25	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00
Warren,O. R2	6.95	7.25	7.75	9.00
Zanesville,O. A10	...	7.25	7.75	9.00

COILS (Cut Lengths ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut-lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

Key To Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)	$15 10.75
Carnegie,Pa.	S18 ....10.60
Cleveland A7	.....10.00
Dover,O. G6	.....10.50
Fontana,Calif.	K1 ....11.65
Harrison,N.J.	C18 ....10.60
Midland,Pa.	C18 ....10.60
NewBritn,Conn.(10)	$15 10.75
Pawtucket,R.I.(11)	NS..10.75
Pawtucket,R.I.(12)	NS..11.05
Sharon,Pa.	S3 .....10.60
Worcester,Mass.	A7 ..10.30
Youngstown	C8 .....10.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. (8)	A10 ..3.75
Warren,O.	R2 .....4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O.	R2 .....5.25

TIGHT COOPERAGE HOOP

Atlanta	A11 .....4.05
Riverdale,Ill.	A1 .....3.90
Sharon,Pa.	S3 .....4.15
Youngstown	U5 .....3.75

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity	R2.. 5.70	5.95
Aliquippa	J5 ... 5.70	6.15
Atlanta	A11 ... 5.95	6.40
Bartonville(19)	K4 5.70	6.15
Buffalo	W12 ... 4.85	...
Cleveland	A7 ... 5.70	6.15
Crawfordsville	MS 5.95	6.40
Donora,Pa.	A7 .. 5.70	6.15
Duluth,Minn.	A7 .. 5.70	6.15
Fairfield	T2 ... 5.70	6.15
Houston,Tex.	S5 ... 6.10	6.55
Johnstown	B2 ... 5.70	6.15
Joliet,Ill.	A7 ... 5.70	6.15
KansasCy,Mo.	S5. 6.30	6.75
Kokomo	C16 ... 5.80	6.05
LosAngeles	B3 .... 6.65	...
Minnequa	C10 ... 5.95	6.45
Monessen	P7 ... 5.95	6.40
Palmer	W12 .... 5.15	...
Pitts.,Calif.	C11. 6.65	6.80
Prtsmth.(18)	P12 .. 6.10	6.60
Rankin	A7 .... 5.70	6.15
So.Chicago	R2 .. 5.70	5.95
So.S.Fran.	C10 .. 6.65	7.10
SparrowsPt.	B2.. 5.80	6.25
Sterling,Ill.(1)	N15 5.70	6.15
Struthers,O.	Y1 .. 5.70	6.15
Torrance,Cal.	C11 6.65	...
Worcester	A7 ... 6.00	6.45

ROPE WIRE

	(A)	(B)
Alton,Ill.	L1 ... 8.65	8.90
Bartonville,Ill.	K4 8.55	8.80
Buffalo	W12 .... 8.55	8.80
Fostoria,O.	S1 .... 8.85	9.10
Johnstown,Pa.	B2 8.55	8.80
Monessen,Pa.	P16 8.55	8.80
Monessen,Pa.	P7. 8.80	9.05
Palmer,Mass.	W12 8.85	9.10
Portsmouth,O.	P12 8.55	8.80
Roebling,N.J.	R5. 8.85	9.10
SparrowsPt.	B2.. 8.65	8.90
Struthers,O.	Y1.. 8.55	8.80
Worcester	J4, T6. 8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala.	R2...4.85
Aliquippa,Pa.	J5 .....4.85
Atlanta	A11 .....5.10
Alton,Ill.	L1 .....5.05
Bartonville,Ill.(1)	K4 ..4.85
Buffalo	W12 .....4.85
Chicago	W13 .....5.10
Cleveland	A7, C20 ....4.85
Crawfordsville,Ind.	MS..5.10
Donora,Pa.	A7 .....4.85
Duluth,Pa.	A7 .....4.85
Fairfield,Ala.	T2 .....4.85
Fostoria,O.(24)	S1 ....5.35
Houston	S5 .....5.25
Johnstown,Pa.	B2 .....4.85
Joliet,Ill.	A7 .....4.85
KansasCity,Mo.	S5 ....5.45
Kokomo,Ind.	C16 .....4.95
LosAngeles	B3 .....5.80
Minnequa,Colo.	C10 ....5.10
Monessen,Pa.	P7 .....5.10
Newark, 6-8 ga.	I-1 ..5.50
No.Tonawanda	B11 ....4.85
Palmer,Mass.	W12 .....5.15
Pittsburg,Calif.	C11 ....5.80
Portsmouth,O.	P12 .....5.25
Rankin,Pa.	A7 .....4.85
So.Chicago,Ill.	R2 .....4.85
So.SanFrancisco	C10...5.80
SparrowsPoint,Md.	B2..4.95
Sterling,Ill.(1)	N15 ....4.85
Struthers,O.	Y1 .....4.85
Torrance,Calif.	C11 ....5.80
Waukegan,Ill.	A7 .....4.85
Worcester,Mass.	A7, T6..5.15

WIRE, Cold-Rolled Flat

Anderson,Ind.	G6 ....6.20
Buffalo	W12 .....6.35
Cleveland	A7 .....5.85
Crawfordsville,Ind.	MS..6.20
Detroit	D2 .....6.20
Dover,O.	G6 .....6.20
Fostoria,O.	S1 .....6.00
Kokomo,Ind.	C16 .....5.70
FranklinPark,Ill.	T6 ..6.20
Massillon,O.	R8 .....5.85
Monessen,Pa.	P16 ....5.85
Monessen,Pa.	P7 .....6.10
NewHaven,Conn.	D2 ....6.50
Pawtucket,R.I.(12)	NS..6.85
Trenton,N.J.	R5 .....6.15
Worcester	A7 .....6.15
Worcester	T6 .....6.50
Worcester	W12 .....6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill.	K4 ....8.50
Monessen,Pa.	P16 ....8.50
Roebling,N.J.	R5 .....8.80
SparrowsPoint,Md.	B2 ..8.60
Johnstown,Pa.	B2 .....8.50

WIRE, Tire Bead

Bartonville,Ill.(1)	K4..10.90
Monessen,Pa.	P16 ....11.40
Roebling,N.J.	R5 .....11.55

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa	J5 ....10.15	12.15
Bartonville(1)	K4 10.25	11.95
Cleveland	A7 ...10.25	12.15
Crawfrdsville	MS.10.30	12.00
Fostoria,O.	S1 ...10.40	13.00
Johnstown	B2 ...10.25	12.15
Kokomo	C16 ...10.25	11.95
Minnequa	C10 ...10.40	12.40
Palmer,Mass.	W12.10.25	12.15
Pitts.Cal.	C11 ...10.60	12.50
Prtsmth.(18)	P12.10.55	12.30
SparrowsPt.	B2..10.35	12.25
Waukegan	A7 ...10.25	12.15

WIRE, MB Spring, High Carbon

Aliquippa,Pa.	J5 .....6.25
Alton,Ill.	L1 .....6.45
Bartonville,Ill.(1)	K4 ..6.25
Buffalo	W12 .....6.25
Cleveland	A7 .....6.25
Donora,Pa.	A7 .....6.25
Duluth	A7 .....6.25
Fostoria,O.	S1 .....6.25
Johnstown,Pa.	B2 .....6.25
LosAngeles	B3 .....7.20
Milbury,Mass.(12)	N6 ..8.05
Monessen,Pa.	P7, P16 .6.25
Palmer,Mass.	W12 ....6.55
Pittsburg,Calif.	C11 ....7.20
Roebling,N.J.	R5 .....6.55
Portsmouth,O.	P12 .....6.25
So.Chicago,Ill.	R2 .....6.25
So.SanFrancisco	C10 ....7.20
SparrowsPoint,Md.	B2 ..6.35
Struthers,O.	Y1 .....6.25
Trenton,N.J.	A7 .....6.55
Waukegan,Ill.	A7 .....6.25
Worcester	A7, T6, W12..6.55
Worcester,Mass.	J4 ....6.75

WIRE, Fine & Weaving(8" Coils)

Bartonville,Ill.(1)	K4 ..8.90
Buffalo	W12 .....8.90
Chicago	W13 .....8.90
Cleveland	A7 .....8.90
Crawfordsville,Ind.	MS..8.95
Fostoria,O.	S1 .....8.90
Johnstown,Pa.	B2 .....8.90
Kokomo,Ind.	C16 .....8.90
Monessen,Pa.	P16 .....8.90
Palmer,Mass.	W12 .....9.20
Portsmouth,O.	P12 .....8.90
Roebling,N.J.	R5 .....9.20
Waukegan,Ill.	A7 .....8.90
Worcester,Mass.	A7 T6..9.20

WIRE, Barbed	Col.
AlabamaCity,Ala.	R2 ...136
Aliquippa,Pa.	J5 140
Atlanta	A11 143
Bartonville,Ill.(19)	K4 ..143
Crawfordsville,Ind.	MS ..145
Donora,Pa.	A7 140
Duluth,Minn.	A7 140
Fairfield,Ala.	T2 140
Houston,Tex.	S5 148
Johnstown,Pa.	B2 140
Joliet,Ill.	A7 140
KansasCity,Mo.	S5 152
Kokomo,Ind.	C16 142
Minnequa,Colo.	C10 146
Monessen,Pa.	P7 145
Pittsburg,Calif.	C11 160
Portsmouth,O.(18)	P12..147
Rankin,Pa.	A7 140
So.Chicago,Ill.	R2 136
So.SanFran.,Calif.	C10 ..160
SparrowsPoint,Md.	B2 ..142
Sterling,Ill.(1)	N15 140

BALE TIES, Single Loop	Col.
AlabamaCity,Ala.	R2 ...123
Atlanta	A11 126
Bartonville,Ill.(19)	K4 ..123
Crawfordsville,Ind.	MS ..132
Donora,Pa.	A7 123
Duluth,Minn.	A7 123
Fairfield,Ala.	T2 123
Joliet,Ill.	A7 123
KansasCity,Mo.	S5 135
Kokomo,Ind.	C16 125
Minnequa,Colo.	C10 128
Pittsburg,Calif.	C11 147
So.Chicago,Ill.	R2 123
So.SanFran.,Calif.	C10 ..147
SparrowsPoint,Md.	B2 ..125
Sterling,Ill.(1)	N15 123

WIRE, Upholstery Spring

Aliquippa,Pa.	J5 .....5.90
Alton,Ill.	L1 .....6.10
Buffalo	W12 .....5.90
Cleveland	A7 .....5.90
Donora,Pa.	A7 .....5.90
Duluth,Minn.	A7 .....5.90
Johnstown,Pa.	B2 .....5.90
LosAngeles	B3 .....6.85
Monessen,Pa.	P7, P16 ..5.90
NewHaven,Conn.	A7 ...6.20
Palmer,Mass.	W12 ....6.20
Pittsburg,Calif.	C11 ....6.85
Portsmouth,O.	P12 .....5.90
Roebling,N.J.	R5 .....6.20
So.Chicago,Ill.	R2 .....5.90
So.SanFrancisco	C10 ....6.85
SparrowsPoint,Md.	B2 ..6.00
Torrance,Calif.	C11 ....6.85
Trenton,N.J.	A7 .....6.20
Waukegan,Ill.	A7 .....5.90
Worcester,Mass.	A7 ....6.20

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala.	R2 ...126
Ala.City,Ala.	..17-18ga.R2 213
Aliquippa,Pa.	9-14½ga.J5 130
Atlanta	A11 133
Bartonville,Ill.(19)	K4 ..130
Crawfordsville,Ind.	MS ..132
Donora,Pa.	A7 130
Duluth,Minn.	A7 130
Fairfield,Ala.	T2 130
Houston,Tex.	S5 138
Johnstown,Pa.	B2 130
Johnstown,17ga.	.6" B2 .204
Johnstown,17ga.	.4" B2 .207
Joliet,Ill.	A7 130
KansasCity,Mo.	S5 142
Kokomo,Ind.	C16 132
Minnequa,Colo.	C10 138
Monessen,Pa.	P7 135
Pittsburg,Calif.	C11 153
Portsmouth,O.(18)	P12 ..137
Rankin,Pa.	A7 130
So.Chicago,Ill.	R2 126
Sterling,Ill.(1)	N15 130

FENCE POSTS

ChicagoHts.,Ill.	C2 140
Duluth,Minn.	A7 125
Franklin,Pa.	F5 140
Huntington,W.Va.	W7 140
Johnstown,Pa.	B2 140
Marion,O.	P11 140
Minnequa,Colo.	C10 130
Moline,Ill.	R2 136
So.Chicago	R2 140
Tonawanda,N.Y.	B12 140
Williamsport,Pa.	S19 150

TRACK BOLTS (20) Treated

KansasCity,Mo.	S5 .....9.85
Lebanon,Pa.,(32)	B2 ...9.85
Minnequa,Colo.	C10 ...9.85
Pittsburgh	O3, P14 ..9.85
Seattle	B3 .....10.35

NAILS & STAPLES, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala.	R2 118
Aliquippa,Pa.(13)	J5 118
Atlanta	A11 121
Bartonville,Ill.(19)	K4 ...118
Chicago,Ill.	W13 118
Cleveland	A9 125
Crawfordsville,Ind.	MS ..122
Donora,Pa.	A7 118
Duluth,Minn.	A7 118
Fairfield,Ala.	T2 118
Galveston,Tex.	D7 126
Houston,Tex.	S5 126
Johnstown,Pa.	B2 118
Joliet,Ill.	A7 118
KansasCity,Mo.	S5 130
Kokomo,Ind.	C16 120
Minnequa,Colo.	C10 123
Monessen,Pa.	P7 124
Pittsburg,Calif.	C11 137
Portsmouth,O.	P12 124
Rankin,Pa.	A7 118
So.Chicago,Ill.	R2 118
SparrowsPoint,Md.	B2 ...120
Sterling,Ill.(1)	N15 118
Torrance,Calif.	C11 138
Worcester,Mass.	A7 124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa.	A3 .$7.35
Wheeling,W.Va.	W10 ..7.35

TIE PLATES

Fairfield,Ala.	T2 .....4.50
Gary,Ind.	U5 .....4.50
Ind.Harbor,Ind.	I-2 ...4.50
Lackawanna,N.Y.	B2 ....4.50
Minnequa,Colo.	C10 ....4.50
Pittsburg,Calif.	C11 ....4.65
Seattle	B3 .....4.65
Steelton,Pa.	B2 .....4.50
Torrance,Calif.	C11 ....4.65

JOINT BARS

Bessemer,Pa.	U5 .....4.70
Fairfield,Ala.	T2 .....4.70
Ind.Harbor,Ind.	I-2 ....4.70
Joliet,Ill.	A7 .....4.70
Lackawanna,N.Y.	B2 ....4.70
Minnequa,Colo.	C10 ....4.70
Steelton,Pa.	B2 .....4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind.	I-2, Y1..6.15
KansasCity,Mo.	S5 ....6.40
Lebanon,Pa.	B2 ....6.15
Minnequa,Colo.	C10 ....6.15
Pittsburgh	J5 .....6.15
Seattle	B3 .....6.65
So.Chicago,Ill.	R2 .....6.15
Struthers,O.	Y1 .....6.15
Youngstown	R2 .....6.15

AXLES

Ind.Harbor,Ind.	S18 ...5.60
Johnstown,Pa.	B2 ....5.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa.	3.60	3.50	3.55	4.00
Ensley,Ala.	3.60	3.50	...	4.00
Fairfield,Ala.	...	...	...	4.00
Gary,Ind.	3.60	3.50	3.55	...
Huntington,W.Va.	...	...	...	5.00
Ind. Harbor,Ind.	3.60	3.50	3.55	...
Johnstown,Pa.	...	...	...(16)	4.00
Lackawanna	3.60	3.50	...	4.00
Minnequa,Colo.	3.60	3.50	...	4.50
Steelton,Pa.	3.60	3.50	...	...
Williamsport,Pa.	S19	...	...	4.75

TOOL STEEL

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	Mo	
18	4	1			1.505
18	4	2			1.650
20.25	4.25	1.6	12.25	3.535-3.675	
19	4	2	7		2.460
18.25	4.25	1.4	4.75		2.125
18	4	2	9		2.445-2.45
13.5	4	3	....		1.6025
W	Cr	V	Mo		
6.4	4.5	1.9	5	0.96-0.965	
6	4	3	6		1.190
1.5	4	1	8.5		0.810

Tool steel producers include: AA, AS, B2, BS, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2, and V3.

Footnotes:

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn. base.
(22) Del. San Francisco Bay area.
(23) 28 Ga. .36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Rail mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Del. square edge.
(33) To jobbers, deduct 20c.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.,Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,Eaton Mfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W8 Wharton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 YoungstownSheet&Tube

for

dependable hardenability with maximum properties in low alloy boron steels

USE *Grainal* ALLOYS

For boron-treated steels, whether made in the electric furnace or in the open hearth, Grainal alloys are used successfully to increase hardenability.

A larger quantity of Grainal is usually required in electric furnace practice because of the higher nitrogen content characteristic of steels produced by this method. The conversion of the nitrogen content of the steel to an ineffective compound, as is done by some of the components of Grainal, permits a minimum amount of boron to produce the desired effects.

Grainal alloys are metallurgically balanced so that the larger additions required by electric furnace steels can be made safely without exceeding the boron limit for hot shortness.

VANADIUM CORPORATION OF AMERICA

420 LEXINGTON AVENUE, NEW YORK 17, N.Y. • DETROIT • CHICAGO • CLEVELAND • PITTSBURGH

MAKERS OF ALLOYS

VANCORAM

CHEMICALS AND METALS

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	29.0	+0.5	+2.5	+5.5
¼	6.0	0.42	28.5	26.5	23.5	+3.5	+5.5	+8.5
⅜	8.0	0.57	23.5	21.5	18.5	+10.0	+12.0	+15.0
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	44.0	41.0	20.5	22.5	19.5
1½	27.5	2.78	42.5	41.5	41.5	21.5	20.0	20.5
2	37	3.68	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Column A: Etna, Pa. N2; Butler, Pa. ⅛-¾", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6. 1 point higher on ½", 2 points lower on ¾" and ⅞". Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36⅛ % on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y1; Alton, Ill., 2 points lower discount L1.

Column D: Butler, Pa. F6. ⅛-⅜": Benwood, W. Va. W10, except plus 5½ % on ⅛", plus 6% on ¼", plus 12% on ⅜"; Sharon, Pa. M6, plus 2.5 on ⅛", 1 point lower on ½". ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 15½ % on 3½" and 4"; Youngstown Y1. Aliquippa, Pa. J5 quotes 1 point lower on ½". 2 points lower on 1", 1½ points lower on 1¼". 2 points lower on 1½" and 2", 1½ points lower on 2½" and 3"; Etna, Pa. N2 and 17½ % on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.92	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mil; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.52	26.41	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2¾	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates— Carbon Base 10%	Plates— Carbon Base 20%	Strip— Cold-Rolled Carbon Base 10%	Strip— Cold-Rolled Carbon Base Both Sides	Sheets— Carbon Base 10%	Sheets— Carbon Base 20%	Sheets— Cu Base Both Sides
302	....	....	....	....	19.75	26.24–27.50	77.00
304	25.00	29.50	....	....	24.50	27.50–27.77	77.00
309	30.50	35.00	....	....	....	....	....
310	36.50	41.00	....	....	....	....	144.00
316	29.50	34.00	....	....	26.00	35.92–36.50	....
317	34.50	39.00	....	....	....	....	....
318	33.50	38.00	....	....	....	....	....
321	26.50	31.00–32.00	....	....	23.00	33.00	111.00
347	27.50	32.00	....	....	24.00	33.50–33.83	130.00
405	21.25	27.75	....	....	....	....	....
410	20.75	27.25	....	....	....	....	....
Nickel	33.55	45.15	41.00	54.00	....	....	....
Inconel	41.23	54.18	....	....	....	....	165.00
Monel	34.93	46.28	....	....	....	....	....
Copper*	....	....	23.70†	29.65†	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:

½-in. & smaller diam.	15
⅝-in. & ¾-in.	18.5
⅞-in. and larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.:	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up bolts	31

NUTS

H.P. & C.P. Square:	Reg.	Hvy.
½-in. & smaller	15	15
⅝-in. & ¾-in.	12	6.5
⅞-in.-1½-in.	9	1
1⅝-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	16.5	6.5
⅞-in.-1½-in.	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	23	17.5
⅞-in. & 1½-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ¾-in.	29.5	22
⅞-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
		Light
⅜-in. & smaller	....	35
½-in. to ⅞-in.	....	28.5
¾-in. to 1½-in.	....	26

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:

¾-in. & smaller	42
⅞-in. through 1 in.	34
Longer than 6 in.:	
⅞-in. & smaller	26
⅞-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.85c

⅞-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..List to list-plus-$1.

FLUORSPAR

Metallurgical grade, f. o. b. shipping point, in Ill., Ky., net tons, carloads, effective CaF₂ content, 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95

CARBON

35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Bait., Types 301-347 sheet, quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, except 303 and 309 E2.

Brackenridge, Pa., Sheets A4 sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 and 0.25c lower on Types 302, 304, 321, 347; 0.50c lower on Types 309 and 316 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip, W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip, except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301.

COAL CHEMICALS

Spot, cents per gallon, ovens	
Pure benzol	.30.00-35.00
Toluol, one deg.	.26.00-33.00
Industrial xylol	.25.00-33.50
Per ton bulk, ovens	
Sulphate of ammonia	$32-$45
Cents per pound, ovens	
Phenol, 40 (carlots, non-returnable drums)	..17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

	Cents
Sponge iron	
98+% Fe, carlots	17.00
Swedish, c.i.f. New York, in bags	.8.85-9.95
Electrolytic Iron:	
Annealed, 99.5% Fe	42.50
Unannealed, 99 + % Fe	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	58.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns	..83.00-148.00
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	33.50
Antimony	75.85
Brass, 10-ton lots	20.00-33.25
Bronze, 10-ton lots	.51.25-60.00
Phosphor-Copper, 10 ton lots	50.00
Copper:	
Electrolytic	....37.25-46.25
Reduced	....33.75-37.00
Lead	25.50
Magnesium	....75.00-85.00
Manganese:	
Minus 100-mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver, 10-ton lots	45.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	..23.00-30.50

	Dollars
Tungsten	
Melting grade, 99%, 60 to 200 mesh, freight allowed:	
1000 lb and over	6.00
Less than 1000 lb	6.15
98.8% minus 65 mesh, freight allowed:	
1000 lb and over	4.15
Less than 1000 lb	4.25
Molybdenum:	
99.9%, minus 200 mesh	3.25
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

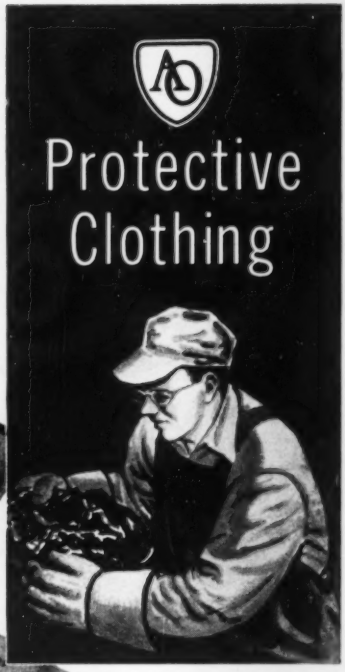
Connellsvill,fur.	$14.50-15.00
Connelsvill,fdry.	17.00-18.00
New River foundry	..21.30
Wise county, foundry	..15.95
Wise county, furnace	..15.20

OVEN FOUNDRY COKE

Kearny, N. J., ovens	..$22.75
Everett, Mass., ovens	
New England, del.	.*24.80
Chicago ovens	23.00
Chicago, del.	24.50
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.42
Cincinnati, del.	25.85
Detroit, del.	26.85
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Birmingham, del.	21.60
Philadelphia, ovens	22.70
Nevillelsland,Pa., ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.85
Flint, del.	26.59
Pontiac, del.	25.47
Saginaw, del.	26.92

* Or within $4.15 freight zone from works.

AO Steel-Stapled **HAND PROTECTION** — Materials Handling Equipment for the HARDEST SERVICE!



AO makes a complete line of steel staple-reinforced, chrome-tanned cowhide gloves, mittens and hand pads. All are made to withstand hard wear on the roughest jobs yet remain flexible and comfortable. Your nearest AO Safety Product Representative can supply you with these BIG VALUES in protection and serviceability.

RECOMMENDED USES:

- **AO 1644 GLOVE** — For heavy operations in foundries and steel mills, heavy casting, handling of rough scrap.
- **AO 1655 GLOVE** — For grinding and rough operations.
- **AO 1660 GLOVE** — For foundry work and grinding.
- **AO 5X138 GLOVE** — For use in steel mills on flying shears, handling rough scrap, etc.
- **AO 5X264 GLOVE** — For handling small castings, rough stock and similar.
- **AO 1674 MITTEN** — Reversible, may be worn on either hand. For handling steel sheet stock, scrap, wheel castings, rough material.
- **AO 1201 HAND PAD** — For steel scrap and rough steel.

AO's Industrial Vision Program increases *production*, decreases *accidents. Write today for free booklet "Improved Industrial Vision."*

American Optical Company
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York(c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.10	6.28	7.74
Boston (city) ..	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	6.98	7.88
Boston (c'try) .	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	6.78	7.68
Phila. (city) ..	6.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try)..	5.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city) ...	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.00	7.64
Balt. (c'try) ..	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va. ..	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va..	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.05	7.80
Wash. (w'hse).	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.)..	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††‖	6.00	6.25	7.55
Buffalo (w'hse)	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††‖	5.80	6.05	7.35
Pitts. (w'hse)..	5.60	6.40*	7.75	5.65-5.95	6.90	5.55	6.40	10.10††	5.70	5.75	7.00
Detroit (w'hse)	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.82
Cleve. (w'hse).	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city)..	6.02	6.59	7.34	5.95	...	5.95	6.51	...	6.24	6.34	7.50
Chicago (city).	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwau. (city).	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try)	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.)	6.05	6.85	8.20	6.00	...	6.00	6.85	10.55	6.23	6.33	7.53
St. L. (w'hse).	5.85	6.65	8.00	5.80	...	5.80	6.65	10.35	6.03	6.13	7.33
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
KansCity(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city).	5.75	6.55	6.90‡	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm(w'hse)	5.60	6.40	6.75‡	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05§	6.60	8.90	6.55	7.75	...	6.55	6.60	9.20
L. A. (w'hse).	6.35	7.90	8.85§	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
Seattle-Tacoma.	6.65	7.80¶	8.90§	6.60	...	6.45	8.20	...	6.45	6.50	8.60
San Francisco..	7.05	8.60¶	9.20§	7.30	...	6.75	9.10	11.15	6.65	6.75	8.80

Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ²—500 to 1499 lb; ³—450 to 1499 lb; ⁴—3500 lb and over; ⁵—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit, del. E Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematities	17.00
Brazilian iron ore, 68-69%	24.00-25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.6c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

REFRACTORIES

Fire Clay Brick

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Hayward, Ashland, Ky., Clearfield, Curwensville, Pa., Ottawa, Ill., $116.60. Hard-Bred, St. Louis, Vandalia, Mo., Olive Hill, Ky., $156.20.

High-Heat Duty: Salina, Pa., $99.60. Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, Curwensville, Lumber, Lockhaven, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Ky., Troup, Athens, Tex., Stevens Pottery, Ga., Bessemer, Ala., Portsmouth, Oak Hill, Ottawa, Ill., $94.60.

Intermediate-Heat Duty: St. Louis, Farber, Vandalia, Mo., West Decatur, Orviston, Beach Creek, Curwensville, Lumber, Lockhaven, St. Marys, Clearfield, Pa., Olive Hil, Hitchins, Haldeman, Ashland, Hayward, Ky., Athens, Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $88; Bessemer, Ala., $79.20.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., $79.20; Parral, O., $78.50; St. Marys, Pa., $76; Ottawa, Ill., $70.

Ladle Brick

Dry Press: Chester, New Cumberland, W. Va., Freeport, Merrill Station, Clearfield, Pa., Irondale, Wellsville, O., $66.

Wire Cut: Chester, Wellsville, O., $64.

Malleable Bung Brick

St. Louis, Vandalia, Farber, Mo., Olive Hill, Ky., $105.60; Beach Creek, Pa., $94.60; Ottawa, Ill., $90.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $94.60; Hays, Pa., $100.10; Joliet, Rockdale, Ill., E. Chicago, Ind., $104.50; Lehi, Utah, Los Angeles, $111.10.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $92.40.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $93.50.

Basic Brick

Per net ton, Baltimore or Chester, Pa. Burned chrome brick, $73-$78; chemical-bonded chrome brick, $77-$82; magnesite brick, $99-$104; chemical-bonded magnesite, $88-$93.

Magnesite

Per net ton, Chewelah, Wash., Domestic dead-burned, ⅜" grains; bulk, $36.30; single paper bags, $41.80.

Dolomite

Per net ton. Domestic burned bulk: Bonne Terre, Mo., $12.15; Martin, Millersville, Narlo, Clay Center, Woodville, Gibsonburg, Bettsville, O., Billimeyer, Plymouth Meeting, Blue Bell, Williams, Pa., Millville, W. Va., $13.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.95c per lb of briquet, c.l. packaged 11.75c, ton lot 12.55c, less ton 13.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 11.15c, per lb of briquet, c.l. packed 11.95c, ton lot 12.75c, less ton 13.65c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

NOTE: For curent quotations on manganese, titanium and "other" ferroalloys, see page 169, Nov. 5 issue; for chromium, silicon, vanadium, boron, tungsten alloys, page 151 Nov. 12 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Oct. 23, 1951

STEELMAKING SCRAP COMPOSITE

Nov. 15	$43.00
Nov. 8	43.00
Oct. 1951	43.60
Nov. 1950	41.33
Nov. 1946	22.22

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Bushelling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 3.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	—10.00
7. Mixed Boring & Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Bushelling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 3.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+ 10.00
29. Shafting	+ 10.00
30. Hard Steel cut 2 ft & under	+ 5.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and open-hearth furnaces or foundries.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

(6) Prices for Grade 30 may be charged only when sold to a gray iron foundry; otherwise price for Grade 29 will prevail.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 bundles less $15.00.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel), for other grades of railroad steel scrap.

2. No. 2 Heavy melting steel	$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5. No. 1 Bushelling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	— 7.00
Cut Rails:	
16. 3 feet and under	— 5.00
17. 2 feet and under	— 6.00
18. 18 inches and under	— 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angle, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+ 12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.

(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.

(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.

(3) For crushing Grade No. 6, $3. For preparing into:

(4) Grade No. 25, $6.

(5) Grade No. 19, $6.

(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.

(7) Grade No. 17 or No. 21, $11.

(8) Grade No. 18, $12.

(9) For hydraulically compressing Grade No. 15, $8.

(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.

(2) For hydraulically compressing Grade No. 13, $6.

For preparing into:

(3) Grade No. 16, $4.

(4) Grade No. 17, $5.

(5) Grade No. 18, $7.

(6) Grade No. 21, $4.

(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.

(2) For preparing Grade No. 3 into Grade No. 11, $7.

(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commission shall be payable to a broker in excess of $1.

Premiums for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.85% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton: Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c; Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, 53c; Butler, Pa., 65c; Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky., 63c; Claymont, Del. (including Chester, Pa.), 73c; Cleveland, 76c; Coatesville, Pa., 50c; Conshohocken, Pa., 20c; Detroit, 95c; Duluth, Minn., 50c; Harrisburg, Pa., 51c; Houston, 57c; Johnstown, Pa., 75c; Kansas City, Mo., 75c; Kokomo, Ind., 51c; Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c; Phoenixville, Pa., 51c; Pittsburg, Calif., 6.c; Pittsburgh (including Beaumer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c; St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O., 51c; Warren, Pa., 75c; Weirton, 70c; Youngstown, 75c.

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory:	
Prep'd.	33.00
Unprep'd.	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	55.00

* F.o.b. shipping point.

For High Density Bales... Use Self-Contained

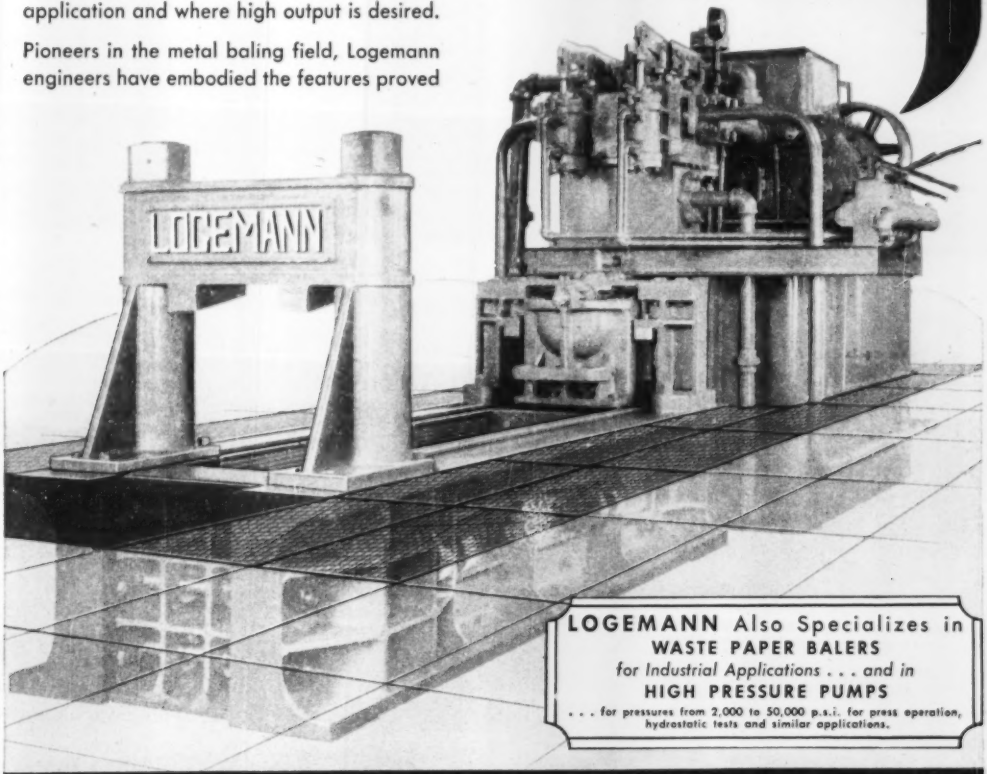
LOGEMANN Scrap Presses

Press, Pump, Tank... All in One Compact Assembly

Where space is limited, plants and mills can conserve floor space and piping, and at the same time handle high tonnages at low operating cost with a Logemann Scrap Press.

Both two and three ram models are available with automatic controls and are recommended when the nature of the scrap warrants such application and where high output is desired.

Pioneers in the metal baling field, Logemann engineers have embodied the features proved through actual operation to be essential to constant, uninterrupted service. Logemann engineers are prepared to offer suggestions as to operating layout and installation of any unusual or specific need. Present your problem to them, stating the nature of your scrap and the tonnage desired. There is no obligation.



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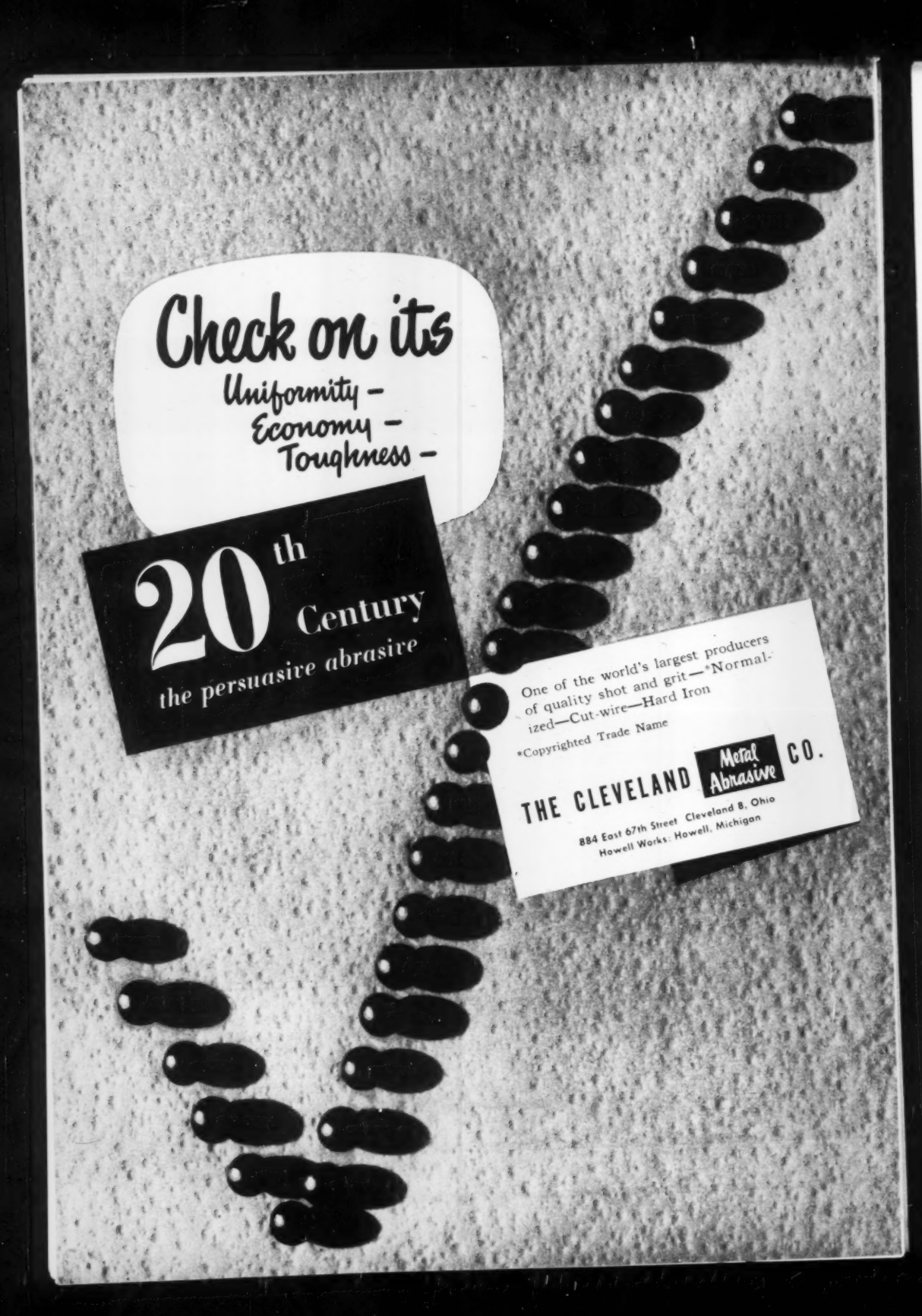
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The Metal Market

Kaiser plans to double capacity of Louisiana aluminum plant which will pour its first metal next month. Substitution of aluminum for copper, where possible, urged by NPA

DESPITE a sharp increase in production of aluminum, supply for civilian use remains as tight as before because of steadily rising government requirements. Because the shortage is relatively temporary, the government is urging aluminum consumers to use this metal instead of copper, which is expected to remain in acutely short supply indefinitely.

Capacity to produce aluminum is being doubled over pre-Korean period, and increasing quantities should be available to nonmilitary consumers within the next two years.

Doubles Plant Capacity—The latest phase of this program to be announced involves Kaiser Aluminum & Chemical Co., Oakland, Calif. This company will double capacity of its facilities at Chalmette, La., to produce an additional 100,000 tons of aluminum for stockpiling and other defense needs. An agreement for the initial 100,000-ton production at the Louisiana plant was announced last November and the first metal is expected to be poured next month.

In addition to increased production of aluminum, Kaiser will expand its alumina plant at Baton Rouge, La., to step up production to 800,000 tons of alumina annually, or about 60 per cent over originally designed capacity. The company will increase bauxite production in deposits now being developed in Jamaica, British West Indies.

As in previous agreements, Kaiser is obligated to sell in the open market up to two-thirds of the metal produced, less the amount required by the government for a period of five years, and 25 per cent to users with no primary producing facilities of their own for 15 years thereafter.

In spite of a 6 per cent drop in primary aluminum production in September, due to power shortages in the Northwest, third-quarter output topped the second-quarter total by more than 6 per cent. September's production of 138,857,530 pounds, which was almost 9 million pounds under the 147,630,992 pounds turned out in August, brought third quarter output to 431,883,793 pounds or a gain of 16.1 per cent over the like 1950 figure.

The industry is confident of developing broader uses of aluminum in the peacetime economy of the country to absorb much of the output now going into war materiel. Military aircraft requirements are the major factor in aluminum consumption for armament.

Conservation — To stimulate the conservation and more effective utilization of scarce materials, National Production Authority explains that production of 7 per cent more passenger cars and 4 per cent more motor trucks is authorized for the first quarter than there are materials available in the industry's CMP allotments. To prevent copper from becoming the limiting factor in motor vehicle production, the industry must develop methods for producing cars with two-thirds the copper normally needed per vehicle. The success of this could mean the difference in quarterly production of as much as 250,000 vehicles.

NPA officials realize that immediate, all-out substitution of aluminum for copper in automotive radiators is impossible. They concede that mass production of aluminum radiators could not begin for at least two years. But, they say, the industry must push its experimental work.

ALUMINUM BOOM: Producers of aluminum believe substantial broadening in peacetime use of the metal, as in irrigation pipe, above, will absorb output of the industry. Capacity is rising rapidly now to supply metal required by the military for other items like the bazooka, below

Tin Stockpiling Halted

Stockpiling of tin has been ordered discontinued by Defense Production Administration. At the same time, the government will institute immediately additional conservation measures designed to bring about a reduced consumption of tin. Such controls will be concentrated on the use of tin plate and tin for brass and bronze.

Lead Supplies Tighten

An emergency situation now exists with respect to lead supplies, says Lead Consumers Industry Advisory committee. This group recommends that metal be withdrawn from the stockpile to make up for loss of imports and for past work stoppages.

A new regulation is being developed to effect some control over the distribution of lead scrap. The proposed order would provide that no person, other than a primary refiner, secondary refiner or dealer, may accept delivery of such material without specific NPA approval.

Another order to allocate lead oxide to battery manufacturers is being prepared.

Anaconda To Open Mine

Anaconda Copper Co. has agreed to produce 30,000 tons of copper annually at its Yerington mine in Lyon county, Nevada during the first two years of operation under an agreement signed with the Defense Materials Procurement Agency. The production rate for the remaining years will be 33,000 tons annually.

Copper which the company cannot sell to industrial users will be purchased by the government at 25.50c per pound, f.o.b. midwest markets. The government will take delivery at the company's Great Falls, Mont., refinery.

DMPA agrees to take a maximum of 128,000 tons during the first six years of operation. Anaconda will invest about $32,750,000 in developing the property which has an estimated life of 10½ years. It is believed that a minimum of 192,000 tons can be produced within six years.

Since the ore is of an oxide variety which requires sulphuric acid in its treatment, Anaconda is acquiring the Leviathan sulphur mine in Alpine county, California, for production of the acid needed to treat the ore.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c; 88-10-2 (No. 215) 38.50c; 80-10-10 (No. 305) 32.25c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 19.50c; brass special 19.75c; intermediate 20.00c; East St. Louis, high grade 20.85c, delivered.

Lead: Common 18.80c; chemical 18.90c; corroding 18.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00c; grade 2, 17.75c; grade 3, 17.25c; grade 4, 16.50c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 103.00.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 58.50c. Prices include import duty.

Mercury: Open market, spot, New York, $220-$222 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.50 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special of patented shapes $2.80.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 88.00c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18% 53.14; phosphor-bronze grade A, 5% 61.07.

Rod: Copper, hot-rolled 37.53; cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze, 95% 41.30; 90% 40.82; red brass, 85% 39.83; 80% 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.25; commercial bronze, 90% 43.79; red brass, 85% 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95% 41.90; 90% 41.42; red brass, 85% 40.43; 80% 39.96; best quality brass, 39.44.

(Base prices, effective Nov. 6, 1950)

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-30.42; l.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l. 29.60-30.60, l.c.l. 30.10-31.10, 100,000 lb lots 29.35-30.35; magnet, del., 15,000 lb or more 34.50c, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Round R317-T4, 178-T4	Round R317-T4	Hexagonal 178-T4
0.125	52.0	....	....
0.126-0.0188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594 to	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $24.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $24.00 per cwt. Traps and bends: List prices plus 80%.

ZINC

Sheets, 26.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 25.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 24.50-26.50c; over 12-in., 24.50-26.50c.

"A" NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Nov. 1-15	24.50	18.80	19.50	103.00	19.00	42.00	56.50	88.00
Oct. 5-31	24.50	18.80	19.50	103.00	19.00	42.00	56.50	88.00
Oct. 4	24.50	18.80	19.50	103.00	19.00	42.00	56.50	84.75
Oct. 2-3	24.50	18.80	19.50	103.00	19.00	42.00	56.50	90.16
Oct. 1	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Oct. Avg.	24.50	18.726	19.426	103.00	19.00	42.00	56.50	88.12
Sept. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Aug. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
July Avg.	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June Avg.	24.50	16.80	17.50	117.962	19.00	42.00	56.50	88.492
May Avg.	24.50	16.80	17.50	139.923	19.00	42.00	50.50	90.16
Apr. Avg.	24.50	16.80	17.50	145.735	19.00	42.00	50.50	90.16
Mar. Avg.	24.50	16.80	17.50	145.730	19.00	42.00	50.50	90.16

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99% del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb, 75.50c; 3000 to 10,000 lb, 76.50c, 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 77.7c; 100 or 350 lb drums only, 100 to 600 lb, 63.1c; 700 to 1900 lb, 60.6c; 2000 to 9900 lb, 58.9c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.19; 500 to 999 lb, $1.195; 200 to 499 lb, $1.20; less than 200 lb, $1.215. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums, 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.0009; more than 2000 lb, 98.09c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, $7.23c, 100 lb kegs 88.23c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	20.75
Phos. bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; navy bronze solids and borings 19.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unweated zinc dross, 13.75c; new clippings and trimmings, 15.50c; engravers' and lithographers' plates, 15.50c; die cast slabs, min. 90% zinc, 13.75c; old zinc scrap, 12.25c; forming and stamping dies, 12.25c; new die cast scrap, 11.75c; old zinc die cast radiator grille, 11.50c; old die cast scrap, 10.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 19.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb, or a flat price of 11.25c a pound of battery plates. Used storage batteries (in boxes) drained of liquid, 7.6c for 15,000 lb or more; 7.45c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 17.25c in lots of 20,000 lb or more; 16.50c in lots under 20,000 lb.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.70; Mixed plant scrap: Copper-free solids, 10.00 dural type, 9.00; Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

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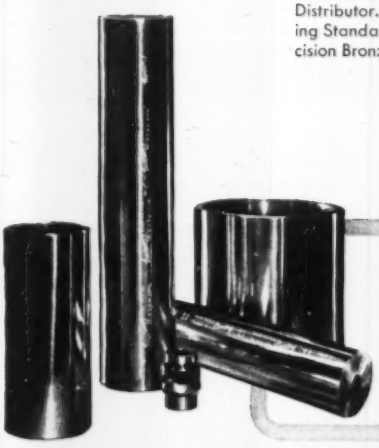

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Reinforcing Bars . . .

Reinforcing Bar Prices, Page 165

Cleveland—Large tonnage of reinforcing bars will be required for the Cleveland rapid transit project. Exact tonnage is not yet known to fabricators. Bids on a portion of the construction, including several bridges and overpasses, are scheduled to close Nov. 30, but expectations are little will be done before spring. Large number of public building projects, especially schools, was approved by voters in the Nov. 6 election, but it is doubtful many of these jobs will become active soon in view of the severe shortage of steel.

Seattle—Reinforcing demand accounts for 75 per cent of local bar mill output. Order backlogs are substantial and operations are at capacity except for one works where ingot output cannot keep pace with rolling mill schedules. Bids will be taken Nov. 20 for a Washington state overcrossing, 500 tons of reinforcing being involved.

Sheets, Strip . . .

Sheet and Strip Prices, Page 165 & 166

New York—Demand for silicon sheets has slowed up due principally to lack of copper required for motors, generators and transformers. The large direct consumers are specifying consistently regardless of this situation in an effort to build inventories, but warehouses have been slowing up as their inventories reach better balance. This is especially true of distributors who handle silicon sheets for the smaller transformer business. Some resellers say business in this product is at almost a standstill at present.

Another specialty in fairly easy demand is straight chrome sheets. Some producers say they have tonnage available for January and could even squeeze in a little more on their books for December shipment. On the other hand, nickel bearing chrome sheets are generally extended into second quarter, especially for atomic energy work, which requires heavier gages and in some instances actual plate. One producer, for instance, now has nothing to offer before June on this heavier gage nickel chrome material.

Most sellers are booked up for first quarter on the general run of carbon sheets, not that they haven't the rolling capacities in various instances but because more semi-finished steel has been diverted to plates. No producers are accepting business in this material for second quarter. Early in the month at least one large producer did accept some tonnage for this position, but quickly withdrew.

Boston—With a few exceptions, including nickel stainless grades and galvanized, flat-rolled steel supplies are easing slightly. Carbon sheets and strip are offered in better volume, both hot and cold-rolled. Stampers find regular suppliers more liberal with deliveries. Stamping shops are experiencing some letdown in orders. Subcontracts are more difficult to obtain than expected.

Philadelphia—Shrinkage in demand

for carbon sheets due to a falling off in requirements for consumer durables, or to government cutbacks in some of these lines, is being offset by increasing diversion of strip capacity to strip plate. The present goal, it is understood, is 200,000 tons of strip plate per quarter. Broadly, there is still more demand for sheets than there is supply.

Pittsburgh — Demand continues strong despite slowdown in consumer goods. Small tonnages are being booked for second quarter, but primarily of a defense nature. Mills were overwhelmed with orders for first quarter for booking on a first-come first-served basis and are happy with NPA's cancellation of the 10 per cent reserve. Terne and electrical material is in better supply.

Cleveland—Easing off in consumer durable goods requirements for the light, flat-rolled products has not resulted in any appreciable letdown in pressure on the mills. Little tonnage is open for first quarter with most mills booked full, especially on the carbon grades. Demand for specialty sheets, such as electrical grade, is slower reflecting letdown in motor production. To some extent this latter is attributable to shortage of copper. Except for high-rated defense work, producers are not yet booking tonnage for second quarter, and they are not expected to open their books for that period until next month.

Youngstown — District producers report a few order cancellations, largely due to customers' inability to obtain CMP tickets. Sharon Steel Corp. is heavily booked with orders for helmet steel.

Cincinnati — Completion of first quarter mill schedules is near. Allocations for domestic needs are smaller. Evidence is developing that CMP tickets exceed mills' production to lesser degree. More liberal supply of zinc sends galvanized output upward, although still far short of pressing demand.

Chicago—Despite fact many sheet users were unable to cash all their tickets for sheets and strip in fourth quarter and are not faring too well in first quarter there is growing belief that balance between supply and demand may improve sooner than expected. There is mounting evidence that inventories in hands of consumers are bigger than supposed.

Los Angeles—With district mills diverting more ingot tonnage to production of plate, sheets are getting scarcer. Japanese 12 gage hot-rolled sheet is finding buyers at prices higher than $200 per ton, delivered within four weeks.

Seattle—This city will open bids Nov. 28 for 27,100 metal street signs and 6000 galvanized steel posts.

Tubular Goods . . .

Tubular Goods Prices, Page 169

Los Angeles—Kaiser Steel Corp.'s electric weld pipe mill at Fontana produced 8021 tons in October.

Seattle—Increased interest in cast iron pipe is expected in December with buyers anticipating spring requirements. Bend, Oreg., will take bids Nov. 20 for 500 tons of 24 and 16-in., also for a 5-million gallon re-

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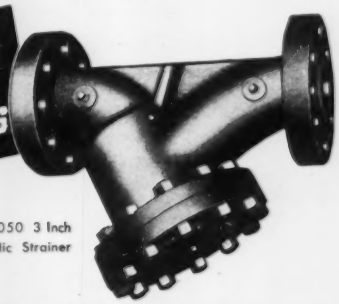

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inforced reservoir, Astoria, Oreg., awarded a small tonnage to the Pacific States Cast Iron Pipe Co.

Steel Bars . . .

Bar Prices, Page 165

Cleveland—Shortage of bars is increasingly distressing with demand showing no signs of slackening. Loss of tonnage at various mills over recent weeks as result of labor trouble contributes importantly to supply stringency. Indications are mill carryovers into first quarter will be much larger than had been anticipated up to this time. Meanwhile, direct defense requirements for bars are rising steadily, more than offsetting any slack in demand on consumer durable goods account. Only a little tonnage has been booked by the bar mills for second-quarter delivery, chiefly on high-rated defense account.

Chicago—Farm implement manufacture is being curtailed by inadequate supply of bars, including hot-rolled, cold-finished and forging grade. It is in this area that greatest interest is being shown currently in conversion steel. Generally demand for bars is almost as intense as for plates.

Philadelphia—Producers of hot carbon bars have until Jan. 1 to open books for second quarter although some indicate they may act before then as they are already out of the market for most sizes for first quarter. First quarter arrearages will have a bearing on supply in the succeeding 3-month period. There have been some recent directives for December. What is going to happen to the displaced tonnage? Can it be handled in first quarter without special directives, or will it have to be included in second quarter tonnage? At the beginning of the current quarter buyers had until Oct. 7 to recertify tonnage that the mills had promised in the third period but were unable to ship. Will there be a repetition of this procedure on carryover into the first quarter?

Boston—Direct defense contracts are bolstering bar demand for forgings and small arms blanks. Among specialties, demand for broaching grades is heavier with some large contracts placed for broaching machines. For Rock Island arsenal, LaPointe Machine Tool Co., Hudson, Mass., has booked 35 broaching machines, contract in excess of $250,000.

New York—Hot carbon bar sellers have not opened books for second quarter. They report a tight situation on most sizes, particularly medium and large material. Some say they can still work in a little tonnage for first quarter but that it is negligible. Second quarter deliveries are being offered on cold drawn carbon bars and on certain alloys requiring special processing.

Pittsburgh—District mills note no easing of the great demand for all sizes of steel bars. They do not expect any relief until far into 1952. Producers are faced by continual pressure from bolt and nut interests for improved deliveries. In general, mills have not accepted any great amount of tonnage for second quarter. Sizes over 3 in. are not as scarce as they were some weeks ago.

Semifinished Steel . . .

Semifinished Prices, Page 165

Dearborn, Mich.—Total output of steel from Ford Motor Co. mills will be increased by about 18 per cent when a $50 million improvement program is completed. In spite of the expanded output, Ford will continue to buy nearly 50 per cent of its steel from other producers. The company expects its program will be nearly completed by fall of 1952. Improvements will increase capacity at the Rouge plant about 190,000 tons of finished steel per year. About 15 per cent of the work is finished.

Among the major equipment to be installed are 37 coke ovens, a coke screening plant, pig casting equipment, and improved new machinery for the open hearth and rolling mill facilities. By April, 1952, 16 new annealing furnaces and 41 bases in the cold rolling mill will have been installed. Already, five new furnaces and 13 new bases are in operation.

Sharon, Pa.—If the company can continue normal operations, Sharon Steel Corp. will break its previous production records this year. Sharon shipped 1,007,000 tons of finished steel during the first 10 months. The company has rated ingot capacity of 1,411,000 net tons.

Birmingham—Although the strike at plants of the Tennessee Coal, Iron & Railroad Co. was ended last week with the workers agreeing to return to their jobs pending settlement of grievances, it will take a week to 10 days to restore full scale production. It is estimated about 150,000 tons of steel were lost by the shutdown. District ingot operations last week were estimated at 50 per cent of capacity, up sharply from 17 per cent the preceding week.

Los Angeles—Annual ingot capacity of 6,670,000 tons, 5.7 per cent of the national total, and 213 per cent greater than in 1939, is indicated for far western steel producers in 1953.

San Francisco—New production record was set by Kaiser Steel Corp. at its Fontana plant in October, its eight open hearths pouring 121,463 tons of ingots. Operating rate was 105.6 per cent of theoretical capacity. Previous high was 111,503 tons in September.

Plates . . .

Plate Prices, Page 165

Philadelphia—Plate producers have received various government directives for December, principally for tonnage for the Atomic Energy Commission. What will happen to requirements of customers whose tonnage is being displaced is not clear. Some mills take the position these requirements cannot be reinstated until they open books for second quarter in the absence of further directives which would come to the aid of those whose tonnage is being replaced. In any event the recent directives will mean arrearages which the mills believe they will be obligated to honor eventually. Currently, mills have not opened books on carbon plates for second quarter.

Boston—First quarter plate mill schedules are filling up with the Navy

placing larger tonnage. Considerable plate mill capacity is taken up by rolled armor plate. Additional sheet-strip capacity is being considered for light plate production.

New York—Despite cutbacks by the government on freight car and ship construction in first quarter, local plate sellers report severe stringency in plain material. Actually, most plate producers will enter first quarter with tonnage arrearages. Meanwhile they are taking no action for second quarter, except on certain high rated government work.

Pittsburgh—Plate supply is very tight and will continue so during first half of 1952. Mills here will be able to roll some lighter gage material on their continuous hot strip mills. This will open up time on heavy rolling units for additional heavy-gage tonnage that NPA is requesting for first quarter. December carry-over tonnage will be a factor in the attempt to up plate production in first quarter. There are still unplaced fourth quarter CMP tickets seeking rolling time in the district.

Seattle — Small fabricators are handicapped by the shortage of plates. A cargo of Japanese plates was quickly absorbed here and importers are reported placing additional orders in Japan for $1 million worth of plates; also $400,000 worth of galvanized pipe. Portland, Oreg. reports allocations have been approved and work will proceed soon on the Mt. Hood water supply line involving 16,000 tons of $\frac{3}{8}$-in. plates.

Structural Shapes . . .

Structural Shape Prices, Page 165

Cleveland—Fabricating shops are having a difficult time getting approved tonnage accepted by the mills for first quarter. Consequently, pressure for tonnage is unrelaxed despite the severe curbs on certain types of construction. Except for some industrial building in this area, construction activity here is limited. In fact, seasonal slowing down is intensifying the dullness. A large volume of public construction is projected in this district, including schools, the Cleveland city rapid transit project, and the Ohio turnpike. However, the shortage of shapes, reinforcing bars and construction steel in general will delay many of these jobs indefinitely. Bids for certain portions of the rapid transit project are now being taken, closing Nov. 30. Included are several bridges and overpasses.

New York—Local structural activity lags with few sizable awards and little outstanding inquiry. Fabricators ascribe sluggishness to government limitations on building. Further restriction in backlogs is indicated. Much under seven to eight months delivery is virtually impossible as it is difficult to get steel cut to proper lengths much before the beginning of second quarter. Further, time is required to process the material in shops.

New York—Wide-flanged beams are being successfully rolled on a 24-in. structural mill by Phoenix Iron & Steel Co., subsidiary of Barium Steel Corp. Traditionally rolled on a universal gray mill, Phoenix is rolling wide flange beams on its 3-high standard mill, passing through four stands. At present 8-in. wide flange beams are being rolled on this mill, but plans are under way for equipment and rolls that will permit rolling other sizes.

Boston—As controls and restrictions reduce new work coming out for estimates, competition increases among fabricators and is beginning to show up in prices. Pending are two power plant expansions taking 2000 tons.

Philadelphia—Governmental restrictions on building construction are reflected in spotty inquiry and relatively few awards. Fabricators' interest in new work is emphasized by approximately 20 bids on all or various sections of the Army Signal Corps depot at Tobyhanna, Pa., requiring 8290 tons. At least 16 fabricators figured on major sections and some also on joists, with other companies bidding solely on the joists.

Pittsburgh—No improvement in the structural picture is expected for months. Many area fabricators are concerned with their inventories even though NPA recently approved only 1415 new construction applications out of a total of 3834 requested. Facilities of one of the area's largest fabricators, Pittsburgh-Des Moines Steel Co., are down due to a strike for the seventh week.

Seattle—Numerous public jobs are up for figures and pressure for structural shapes is increasing. Prospective work includes 2500 tons for Boeing hangar, 3500 tons for Army warehouses at Auburn, Wash., 600 tons for Bonneville Power Administration building, and unstated tonnages for rebuilding Tacoma's city hall and Army structures at Mount Rainier ordnance depot.

Warehouse . . .

Warehouse Prices, Page 171

Pittsburgh—District warehouse operators are short of all items. They are having difficulty keeping on hand and securing wide flange and sections 6 in and larger. Plates 1-in. and thicker and bar shapes are in shortest supply. Distributors see a little improvement after the first of the year when they will be allowed 100 per cent of their base period receipts.

Cleveland—With the easing off in consumer durable goods demands, warehouses are under less pressure for tonnage, but they still are unable to care for all their customers' requirements because of unbalanced stocks. Some distributors report a slight improvement in their inventory position and they expect their stocks will be noticeably improved after the turn of the year when they begin to receive larger tonnage from the mills, receipts to be 100 per cent of their intake in the base period. Significantly, warehouse customers are showing resistance to accepting anything that passes as steel, insisting increasingly on first-quality material. This is especially noticeable in the flat-rolled products.

Cincinnati—Some slackening in de-

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mands for warehouse steel is noted although they remain far in excess of supplies, and stocks are unimproved. Pinch in structurals and plates is severe.

Los Angeles—Warehousemen expect a 10 to 15 per cent sales increase in first quarter when 100 per cent of their base period receipts will be allowed.

Seattle—Distributors report steady demand with shortages prevailing in the various product categories. Increase in tonnage receipts beginning Jan. 1 will ease the inventory situation somewhat, but supply will still fall short of demand.

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Tin Plate . . .

Tin Plate Prices, Page 166

Pittsburgh—Despite reports producers are in line for sizable cuts in their tin allocations for first quarter, district mills feel there will be some relief offered to them to help in the immediate problem of getting sufficient tin plate to the canmakers for the spring canning season. Studies are being made to see what changes can be made in end uses that would enable other materials to be substituted.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 169

Sharon, Pa.—New arrangement is expected to be worked out by Sharon Steel Corp. to assure it a supply of coke from a government-owned plant at Morgantown, W. Va. Since end of the war Sharon operated the plant under lease. Recently the lease was cancelled and the government opened negotiations with a chemical company to take over the plant. Meanwhile, Sharon has continued to operate the works on a month-to-month basis. It uses part of the coke from this plant in its three blast furnaces at Lowellville, O., and Farrell, Pa.

Cleveland—Coke supply is no problem at present in this consuming area. Since last summer stocks have steadily improved, the foundries being able to build inventories to the point there is no threat of being caught short. Curtailment in foundry operations due to cutbacks in consumer durable goods largely accounts for the betterment in supply. Although oven coke is plentiful some Connellsville beehive coke continues to move on contracts to consumers here. It also is reported substantial tonnages of Connellsville coke are finding a ready market in the Chicago district.

Detroit—Some of the new coke-making capacity being installed at the Rouge plant will provide tonnage for the new Ford foundries now under construction, one at Cleveland, and one at the Rouge. The 183 coke ovens now operating produce 1,225,000 tons annually. The new ovens will hike capacity to 1,430,000 tons.

Chicago—Foundry coke supply is adequate for all present needs and only an unanticipated pick-up in gray iron jobbing shop operations could put a strain on this fuel. Sellers are actively soliciting business.

Pig Iron . . .

Pig Iron Prices, Page 164

New York—There is still more demand for pig iron than there is tonnage available but the situation has eased in certain degree. Some jobbing foundries' business is off with backlogs shrinking appreciably. Hence, they are less concerned about pig iron shipments. In certain instances these shops have reached the point where they have close to 30 days' supply of iron on hand, the limit set by the government on domestic material. In one isolated instance, a pig iron producer has approached one or two of his older customers with an inquiry whether more iron might be needed. However, more iron is being sought than appears available.

Buffalo—While merchant pig iron has shown easier tendencies recently, no reports are heard from producers that iron is being piled. A tapering off in motor casting is reflected in demand. However, basic iron is very much in demand with an estimated 75 to 80 per cent of current production moving into ingot channels.

Philadelphia—Interest is quickening in first quarter pig iron tonnage. Most consumers have a good idea as to their minimum needs and are asking domestic shippers what they can reasonably expect. Many consumers of foundry iron indicate they will require more than in the current period.

Pittsburgh—Many hundreds of tons of pig iron were lost due to the cooling system failure at Youngstown Sheet & Tube's No. 1 blast furnace. As a result of the shut-down the company's bessemer also had to stop operations. The units are now back in production. No change is noted in demand for iron from last week when cutbacks in foundry schedules for gray iron consumer products eased somewhat. Producers see demand and supply slowly coming into a better balance.

Cleveland — Merchant iron sellers are under somewhat less pressure for tonnage, but overall supply conditions are little changed. Slackened operations at some foundries because of slower demand for light castings on durable consumer goods account have been only partially offset by increased demand on defense account. Some foundries could enlarge their production schedules if additional skilled labor were available. Resumption of operations at two blast furnaces here that had been down for repairs since September will materially ease the supply pinch over coming weeks. Both stacks resumed at the opening of this month.

Chicago—Despite declining operations of gray iron foundries through scaling down of consumer goods manufacture and low volume of defense orders to serve as replacement, sellers report no cancellations or delivery suspension for pig iron. Nevertheless

Certified Steel Abrasives
Reg. U. S. Pat. Off.
FOR USE IN BLAST CLEANING EQUIPMENT
SAMSON SHOT
ANGULAR GRIT
PITTSBURGH CRUSHED STEEL CO., PITTSBURGH, PA.
STEEL SHOT & GRIT CO., BOSTON, MASSACHUSETTS

pressure for iron is less intense than it has been.

Cincinnati—District foundries would take more pig iron if it were available. Shipments sustain current schedules and furnace interests are under less pressure than earlier in the year. Makers of heating equipment and machine tools are operating at high level.

Scrap . . .

Scrap Prices, Page 172

Chicago — With more moderate temperatures scrap flow has returned to pre-storm volume. It is estimated about five days' supply was lost through reduced yard operations and delayed rail traffic. Inventories of steelmaking grades in this district average from 3 to 4 weeks. Outlook for improvement is scant in face of continued OPS allocations east, continuance of overcapacity steelmaking rate and slowing collections due to colder weather. First week of the Chicago area scrap drive netted 2500 tons but 30,000 is expected before the month is out with collection efforts likely to be intensified.

Detroit—Intake of scrap picked up last week after being reduced to a dribble by the snow storm. The city is investigating the possibility of digging up abandoned street car tracks, some 31 miles of which are not covered. Using manual methods it is estimated removal and repaving would cost $7000 more than could be realized from their sales even with the bonus for such scrap. Machine methods are being explored along the line followed elsewhere.

Youngstown — District steelworks, short of scrap for months past, have been able to sustain high-level operations only through receipt of tonnage under allocation from other areas. Meanwhile an aggressive collection campaign for scrap is being pushed in the area with fairly encouraging results. Recent shutdown of the Brier Hill works of Youngstown Sheet & Tube Co. enabled that works to build its scrap pile to about 12,000 tons, equal to eight days' requirements. Normally this plant would have 100,000 to 150,000 tons in inventory at this season.

Cleveland—Shipments of steelmaking scrap in this district have dropped as much as 50 to 60 per cent during the last two weeks. Brokers attribute it mainly to provisions of the latest amendment to the scrap price order which, in effect, reduced profit margins available to dealers and other interests below the broker level. Prior to the amendment competition for unprepared material was extremely keen, lifting prices close to those allowed on prepared material. The order reduced dealer prices on some grades as much as $7 a ton. Other factors contributing to the slowness in movement of scrap are yearend tax consideration and a recent short period of unfavorable weather in the Midwest and East. Brokers expect a somewhat heavier movement of scrap after the first of the year.

Cincinnati—Shipments of scrap are supporting mill operations at high levels. However, stocks are meager and lack of reserves presents a problem as winter nears. Supplies of cast scrap are slightly easier.

Pittsburgh—Scrap supply in this area remains critical. There has been some improvement in movement but to date it is not too encouraging. Any increase in mill receipts is quickly eaten up by the district's continuing high steel production rate. Reduced foundry operations have taken off some of the pressure for cast scrap. Mill inventories range from a few days to a few weeks.

Buffalo — Weather conditions improved last week and dealers were busy shipping on allocation orders to two outside distressed points—one in the Pittsburgh area, the other in the Youngstown sector. Meanwhile, local mills were forced to draw from reserve stocks to maintain capacity production schedules. "A definite softness is apparent in the cast market but prices are holding to control levels.

Philadelphia—While less foundry steel scrap is leaving the district than a few weeks ago, local mills find inventories showing little improvement. Yards are getting less tonnage to process. Collections of the heavier grades are definitely off.

Los Angeles—Scrap price ceiling increases have been successful in reducing upgrading. Dealers report improvement in steelmaking scrap supplies and an easing in demand for foundry scrap. Bethlehem Pacific Coast Steel Corp. imported 7000 tons of battlefield scrap from Korea, it is reported here.

Seattle — Scrap receipts are just about sufficient to support current steelmaking operations. Some offshore material is coming into the district and is being readily absorbed at prices $10 to $12 per ton above the domestic market. Scrapped mining and other industrial equipment, heretofore uneconomical to handle, is coming in from Alaska.

Iron Ore . . .

Iron Ore Prices, Page 171

Cleveland — Early fall prospect of a 90 million ton ore shipping season on the lakes has vanished. The final figure, however, will exceed easily the former peacetime record set in 1948 and will be second only to the 1942 all-time high of 92,076,781 tons. Stockpiles accumulated for winter use are adequate to cover all anticipated needs. As freighters release their cargoes at lower lake docks, some are either being sent early into winter repair berths, or dispatched for final loadings of ore or grain. Some will hold grain in winter storage.

Shipments of Lake Superior iron ore for the week ended Nov. 12 totaled 1,556,279 tons compared with 1,730,108 for the like week a year ago, reports the Lake Superior Iron Ore Association. Shipments for the season to Nov. 12 total 84,826,492 tons compared with only 73,491,356 for the like period a year ago.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

500 tons, transmission towers for Bonneville Power Administration, Portland, Oreg., to Creamer & Dunlap, Tulsa, Okla., low, $146,962.

300 tons plus, penstock gates, guides and

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hoists for Lookout Point dam, Oregon, to Berger Engineering Co., Seattle, low $186,000, to U. S. Engineer, Portland, Oreg.

STRUCTURAL STEEL PENDING

3500 tons, (if structural design is adopted) Army warehouses, Auburn, Wash.; Bennett Campbell Inc. and J. C. Boespflug Construction Co., Seattle, low, $4,368,524, to U. S. Engineer, Seattle, for two and three buildings, respectively.

1000 tons, tunnel supports and liner plates, for Palisades dam, Idaho; bids to Bureau of Reclamation, Twin Falls, Idaho, Nov. 27.

600 tons, Bonneville Power Administration office building, Portland, Oreg.; plans being completed; bids probably in December.

600 tons, steel bridges, traffic interchange, Longfellow bridge, Charles river reservation, Boston; Munroe-Langstroth Inc., Norwood, Mass., low, $365,283.99.

500 tons or more, 294 stoplogs, lifting beams, etc., McNary dam fish collection system; Premier Gear & Machine Works, Portland, Oreg., low, $1,422,918, to U. S. Engineer.

475 tons, state bridge, Salem county, New Jersey; bids Nov. 27.

400 tons, state bridge, Tinpahn county, Pennsylvania; H. J. Williams Co., York, Pa., low on general contract.

Unstated, Army Supply Depot, Marion, O.; bids closed Nov. 15.

Unstated, outside utilities, waste disposal system, etc., Hanford Works; L. H. Hoffman, Portland, Oreg., low $810,000.

Unstated, bridges for Columbia-Olympia line; general award by Bonneville Power Administration to Port Construction Co., Port Angeles, Wash., low $248,144.

REINFORCING BARS . . .

REINFORCING BARS PLACED

3625 tons, corps of engineers, Tullahoma, Tenn., to Bethlehem Steel Co.

225 tons, state highway work and bridges, East Hartford-Glastonbury, Conn., to Truscon Steel Co., New York; D. V. Frione & Co, Inc., New Haven, Conn., general contractor; Phoenix Bridge Co., Phoenixville, Pa., 80 tons, fabricated structural steel.

100 tons, school addition, Quincy, Mass., to United States Supply Co., Cambridge, Mass.; James S. Kelliher, Quincy, general contractor.

REINFORCING BARS PENDING

1000 tons, (if concrete design adopted) Army warehouses, Auburn, Wash.; general bids in.

500 tons, state girder overcrossing, Snohomish county, Washington; bids to Olympia, Nov. 20.

325 tons, also 35 tons shapes, intake and outlet system, Lucky Peak dam; bids to U. S. Engineer, Walla Walla, Wash., Nov. 20.

110 tons, Sullivan sewage pumping station; bids to Portland, Oreg., Dec. 19.

PLATES . . .

PLATES PLACED

1056 tons, Navy purchasing office, Washington; 2705 tons to United States Steel Co., Pittsburgh, and 1390 tons to Lukens Steel Co., Coatesville, Pa.

100 tons, estimated, 72-foot diameter steel spherical storage vessel, Corps of Engineers, Tullahoma, Tenn., to Hammond Iron Works, Warren, Pa., $152,330.

100 tons, fuel tank for Elelson air field, Alaska, to Puget Sound Sheet Metal Works, Seattle; Morrison-Knudsen Co., general contractor.

100 tons or more, underground fuel storage tanks, Army engineers, Jacksonville, Fla., to Butler Mfg. Co., Birmingham, Ala., $172,729.

100 tons, estimated, 300,000-gallon elevated water storage tank, Naval Air Station, Glenview, Ill., to Chicago Bridge & Iron Co., Chicago, $78,470.

PLATES PENDING

16,000 tons, $\frac{5}{8}$" plates, main supply Bull Run water line; allocations reported approved; bids to Portland, Oreg., expected within 30 days.

100 tons or more, 300,000-gallon elevated tank on 100-foot tower, Board of Water Works Commissioners, Winchester, Tenn.; bids Nov. 21.

100 tons, estimated, elevated steel water tank, Cynthiana, Ky., Pittsburgh Des Moines Steel Co., Pittsburgh, low, $52,900.

PIPE . . .

STEEL PIPE PLACED

100 tons or more, 96,220 feet, 8.625 inch O.D., Corps of Engineers, St. Louis, to National Tube Co., Pittsburgh.

CAST IRON PIPE PENDING

500 tons, 24 and 16 inch cast iron pipe, also concrete reservoir and equipment; bids to Bend, Oreg., Nov. 20; alternatives also asked.

RAILS, CARS . . .

LOCOMOTIVES PENDING

Central Procurement agency, Marietta Transportation Corp., Marietta, Pa., 53 miscellaneous diesel-electric units; bids Nov. 27.

RAILROAD CARS PLACED

Barrett Division, Allied Chemical & Dye Corp., New York, 100 all-welded 70-ton tank cars, to American Car & Foundry Co. for construction at its Milton, Pa., plant.

RAILROAD CARS PENDING

Purchasing and Contracting Office, Marietta Transportation Corp., Marietta, Pa., 89 cars including kitchen, troop and hospital units; bids Nov. 15.

Western Maryland, 750 fifty-ton hopper and 250 fifty-ton steel box cars; bids asked.

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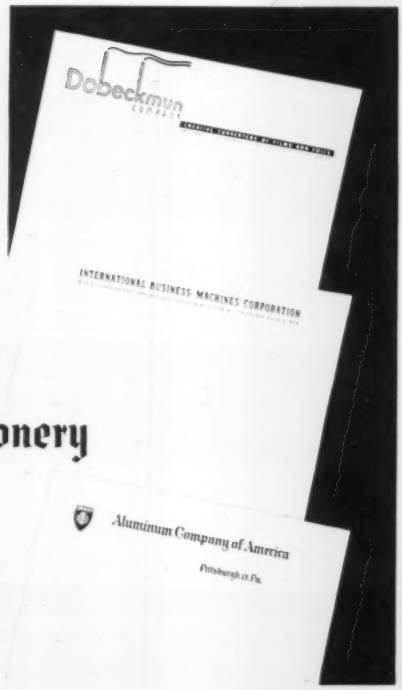

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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Hamilton and Brighton Merge

Hamilton Copper & Brass Works moved its plant from Hamilton, O., and consolidated the company with Brighton Copper Works Inc., Cincinnati. The company's address is 820 State Ave., Cincinnati 4.

General Drop Forge Expands

General Drop Forge Co., Buffalo, is erecting two new foundry buildings, one for a shear shop, the other for a hammer shop. Total cost is estimated at around $500,000. The Buffalo plant is owned by Dana Corp., Toledo.

Boost For Tungsten Output

Vanadium Corp. of America, New York, leased the tungsten mill of Hetzer Mines Inc. at Nederland, Colo. Vanadium Corp. will enlarge the mill's capacity in order to process local tungsten ores.

Echo Machine Tool Organized

A business name has been filed in the Erie county, New York, clerk's office for Echo Machine Tool, 217 Vulcan St., Buffalo, by Adelaide J. Champagne and Herbert J. Oppenheimer.

Chain, Gear Maker Expands

J. W. Minder Chain & Gear Co. Ltd., Los Angeles, purchased a building at 6011 S. Central Ave., that city to house its offices, warehouse and manufacturing facilities. Purchase of property and improvements totaled about $250,000.

Work on Plant Progresses

Structural steel frame for the $2 million Fairchild Engine & Airplane Corp. plant at Bay Shore, L. I., has been completed. The plant, which will be used by the Stratos Division for the manufacture of aircraft assemblies, is scheduled to be completed early next year.

Boston Woven Hose Expands

Boston Woven Hose & Rubber Co., Cambridge, Mass., has broken ground for a $1 million reclamation plant at 29 Hampshire St., that city. The plant is scheduled to be completed in the second quarter of 1952.

Forms Uranium Mining Firm

Santa Fe Railway organized a wholly-owned subsidiary, Haystack Mountain Development Co., to mine uranium ore discovered on its property near Grants, N. M. Haystack will have its home offices at Albuquerque, N. M. Negotiations are now in progress with Anaconda Copper Co. for the sale and delivery of the ore when mined. Anaconda, in turn, is negotiating with the Atomic Energy Commission for permission to build a mill for processing the ore.

O'Connell Machinery Moves

O'Connell Machinery Co., rebuilders of precision machine tools, shifted operations to its new $100,000 plant at 1695 Genesee St., Buffalo.

Central Plans Factory

Central Scientific Co., Chicago, will construct a 50,000 square foot plant and warehouse in Los Angeles for manufacture of scientific instruments and laboratory supplies.

Meehanite Issues Licenses

Meehanite Metal Corp., New Rochelle, N. Y., signed contracts with the following for the production of Meehanite castings: Massey-Harris Co. Ltd., Toronto, Ont.; Compton Foundry, Compton, Calif.; Bates & Co. Stoves Pty. Ltd., Melbourne, Victoria, Australia; W. H. Dorman & Co. Ltd., London, England; A/B Kockums Mekaniska Verkstads, Malmo, Sweden.

Metalworking Plant Opened

Rolled Steel Products Corp. opened its new offices and plant at 6161 Maywood Ave., Huntington Park, Calif. The plant is equipped to handle a complete line of flat-rolled and roll-formed metal products. The company also is engaged in the steel processing, conversion and distributing business.

Alloy Producer Reorganizes

Alloys & Products Inc., New York, was reorganized with Henry Hecht president and Andrew E. St. John, vice president and treasurer. The company specializes in the manufacture of master alloys and hardeners and metals in shot form. A line of aluminum and copper-base ingot for foundry use is contemplated.

Houghton Expands Facilities

Houghton Laboratories Inc., Olean, N. Y., is producing a broad line of platisols and organosols. Production facilities at both the Olean and Smethport, Pa., plants have been expanded considerably. These products are used as coatings for coils, bus bars, paper and cloth, transmission belting, gloves and staple fibres; also for coating electroplating racks

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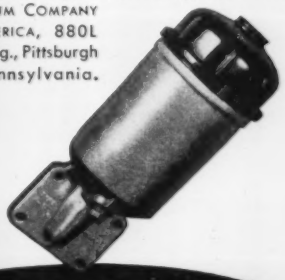
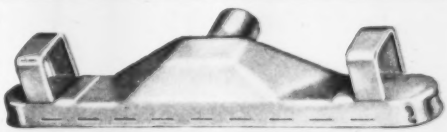
ALUMINUM COMPANY OF AMERICA, 880L Gulf Bldg., Pittsburgh 19, Pennsylvania.



ALCOA ALUMINUM CASTINGS



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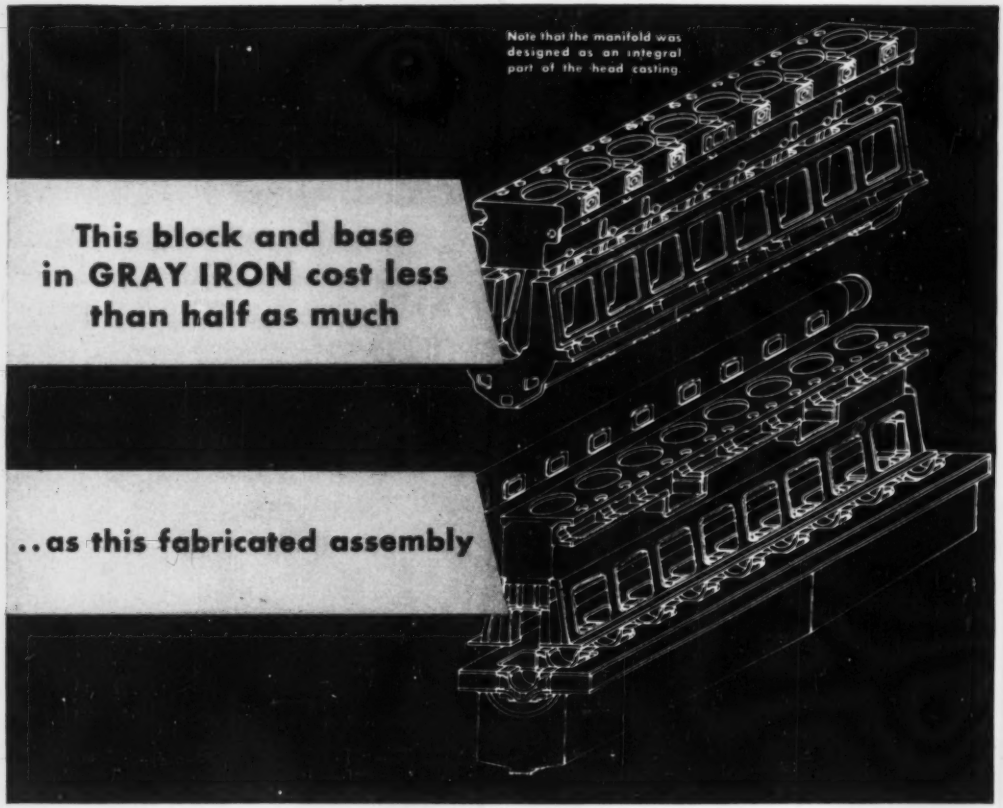
Note that the manifold was designed as an integral part of the head casting.
This block and base in GRAY IRON cost less than half as much
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GRAY IRON FOUNDERS' SOCIETY, INC.

NATIONAL CITY-E. 6th BLDG., CLEVELAND 14, OHIO

and tanks, dipping baskets, ducting and pipe.

Reliance Opens Sales Office

Reliance Electric & Engineering Co., Cleveland, opened a branch sales office at 2144 Madison Ave., Toledo, O. John Drollinger Jr. is branch manager.

Airesearch To Enlarge Plant

Airesearch Mfg. Co of Arizona, Division, Garrett Corp., Phoenix, Ariz., will construct a 54,000 square foot addition to its plant for manufacture of electronic controls and small gas turbine engines.

Anodizing Facilities Expanded

J. H. Cristil Co., Edgerton, O., is erecting a building in that city to house an expanding anodizing department and the shipping department.

Calpatio To Build Furniture

Calpatio Co. was organized in Monrovia, Calif., to engage in the manufacture of steel furniture. Factory and offices are located at 1714 S. California Ave., that city.

Yale Appoints Distributor

Yale & Towne Mfg. Co.'s Philadelphia Division appointed Baker Equipment Engineering Co., Richmond, Va., as representative for the Yale line of materials handling machinery in Charleston, W. Va., area.

Will Build Motor Factory

U. S. Electrical Motors Inc., Los Angeles, will build a plant in Anaheim, Calif. First unit will have about 250,000 square feet of plant floor space and about 50,000 square feet for offices.

Eclipse Fuel Names Agent

Eclipse Fuel Engineering Co., Rockford, Ill., appointed M. K. Griggs Co., Houston, as its representative for that region. Eclipse manufactures industrial gas and oil-burning equipment.

Unites Machinery Divisions

Food Machinery & Chemical Corp., San Jose, Calif., will consolidate the activities of its canning machinery divisions. Effective Jan. 1, Anderson-Barngrover Division, San Jose, and Sprague-Sells Division, Hoopeston, Ill., will be combined into one operation to be known as the Canning Machinery Division. William de Back, vice president of the corporation and manager of the Anderson-Barngrover Division, will assume new duties in connection with overall corporate domestic and foreign activities. Clifford K. Wilson, vice president of the corporation and manager of the Sprague-Sells Division, will manage the Canning Machinery Division and will make his headquarters in San Jose.

GM Plans $7 Million Plant

Completion of the real estate purchase from the city of a 100-acre tract off Lyell avenue, Rochester, N. Y., by General Motors Corp. for construction of a $7 million plant for Delco Appliance Division was announced.

Plating Works Expands

Gene's Plating Works, Los Angeles, Calif., is constructing a plant in conjunction with its present facilities at 3498 E. Fourteenth St., that city.

Tinnerman Appoints Agent

Tinnerman Products Inc., Cleveland, appointed New York Brass & Copper Co. Inc., New York, as its general distributor in the metropolitan area of that city.

Victor Mfg. Buys Plant

Victor Mfg. & Gasket Co., Chicago, purchased a plant at 5659 W. Taylor St., that city, from Central Waxed Paper Co.

Topper Buys Optimus Firm

Topper Equipment Co., Matawan, N. J., purchased Optimus Equipment Co. patents, trade marks, manufacturing rights, sales rights, engineering drawings, as well as certain inventory and machinery pertaining to the vapor degreasing business. Optimus Equipment

FOR JETTISONING FROM JETS: Pylon for carrying fuel tanks or armament on F-84 Thunderjets gets a final check before shipment from Westinghouse Electric Appliance Div., Mansfield, O., to Republic Aviation Corp., Farmingdale, N. Y. The entire unit can be jettisoned if necessary

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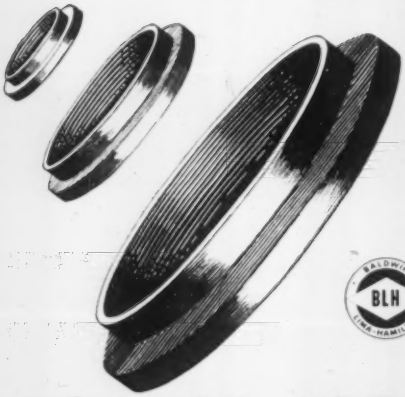

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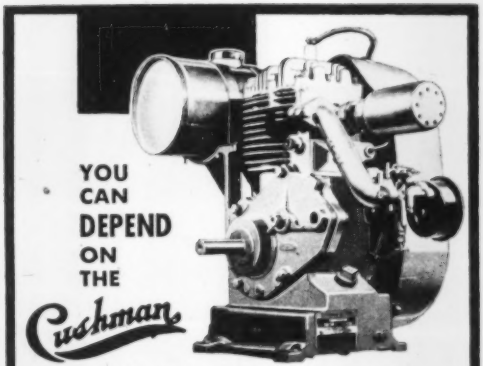

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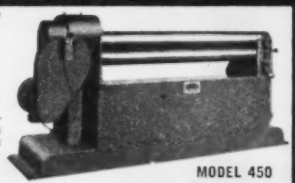

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WHITEHEAD STAMPING CO.
EST. 1903
1667 W. Lafayette • Detroit 16, Mich.

Co., a subsidiary of Hanson-Van Winkle-Munning Co., Matawan, has discontinued operations and will be dissolved.

Fire Causes $50,000 Loss

Fire damaged Plymouth Metal Products Co.'s building at 505 W. Harrison St., Plymouth, Ind. Little of the metal stock can be reused, though some of the machinery may be salvaged. Loss is estimated at $50,000.

Ziegler Opens Branch Office

Ziegler Steel Service Co., Los Angeles, opened a branch office at 310 W. Third St., Wichita 2, Kans. Aircraft quality sheet, strip and plate are offered.

Winners in Redesign Contest

W. E. Eccles and T. O. Kuivinen, Cooper-Bessemer Corp., Mt. Vernon, O., were awarded first prize in a competition sponsored by Gray Iron Founders' Society Inc., Cleveland. Joseph L. Grenko, Textile Machine Works, Foundry Division, Reading, Pa., won second prize; J. Douglas James, Cooper-Bessemer Corp., Grove City, Pa., third prize. The contest was for the best redesign of a machine part for production in gray iron instead of some other material.

Lacquer Research Expands

United Lacquer Mfg. Corp., Linden, N. J., will triple its research facilities in that city. The firm's research expansion will be accomplished by construction of a laboratory building and by taking over an area in an existing factory building now used for other purposes.

Rice & Adams Broadens Line

Pressed Steel Car Co.'s Rice & Adams Equipment Division, Buffalo, will broaden its product line to include fuel-oil storage tanks for homes. Its regular line consists of dairy equipment.

Walton Tool Enlarges Plant

Walton Tool & Die Co., Burbank, Calif., is adding manufacturing space to increase production of electronic component units, tools, dies, and sheet metal products. Completion is scheduled by Dec. 15.

Niagara Firm Changes Name

Niagara Platers Inc., North Tonawanda, N. Y., changed its name to Niagara Tube Products Inc. John C. Logan, president, said the company has changed its operations from electro-plating to the manufacture of fabricated tubular parts for metal furniture.

Shallcross Mfg. Expands

A building program by Shallcross Mfg. Co., Collingdale, Pa., nearing completion includes a new wing on the main factory building for general production facilities; expansion of the firm's instrument factory; establishment in separate quarters of a large component development laboratory devoted to precision resistors and various electronic specialties.

Hahn Buys Stratford Brass

Lewis Hahn, general manager, Hahn Brass Co., New Hamburg, Ont., announced purchase of Stratford Brass Co. Ltd., Stratford, Ont.

Alco Enlarges Dunkirk Plant

Alco Products Division, American Locomotive Co., Dunkirk, N. Y., is erecting a $150,000 addition to be used for the cleaning and packaging of pipe produced at the plant.

Instrument Firm Building

Birtcher Corp., Los Angeles, is constructing a $500,000 plant in Alhambra for manufacture of electro-surgical medical instruments.

Opens Chicago Warehouse

Chicago Steel Service Co. opened its $1.5 million general offices and warehouse located on Kildare avenue at 45th street, in Chicago. Walter D. Monroe Jr. is president.

Adamas Appoints Agents

Adamas Carbide Corp., Harrison, N. J., producer of tungsten carbide tool tips, dies and wear parts, appointed K. J. Papke Co. Inc., Milwaukee, Austin Ford Logan, Buffalo and Syracuse, and Joseph G. Windheim, Rochester, as representatives in their respective areas.

Plans $5 Million Plant

Armour & Co., Chicago, awarded a contract to George A. Fuller Co., that city, for construction of a $5 million pharmaceutical plant and laboratory near Kankakee, Ill.

Cutlery Firm Buys Pictou

W. R. Case & Sons Cutlery Co., Bradford, Pa., purchased Pictou Cutlery Ltd., Pictou, N. S. A Canadian subsidiary of the parent company was formed to take over the Pictou plant.

Delaware Issues Charters

Corporation department, secretary of state's office, Dover, Del., chartered Hard Carbides Inc.—machines for manufacturing molds and dies—with Prentice-Hall Corporation System Inc., Dover, serving as the principal office. A charter was issued also to French Electric Products Co.—machinery—with U. S. Corporation Co., Dover, serving as the principal office.

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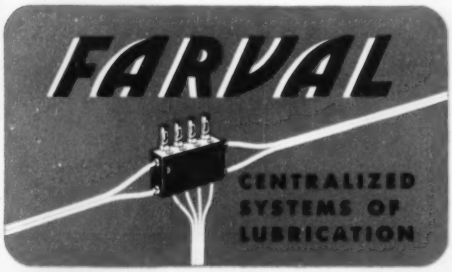

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